Tagging of Herring in British Columbia During the 1981-1982 Herring Season

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ABSTRACT

Haegele, C. W., C. E. Turner, L. Hop Wo, and D. C. Miller. 1982. Tagging of herring in British Columbia during the 1981-1982 herring season. Can. Ind. Rep. Fish. Aquat. Sci. 140: x + 65 p.

Herring are being tagged in British Columbia with external anchor tags to determine the discreteness and migratory movements of herring stocks. The scope of the program was coast-wide at its inception in 1979-1980 but tagging was restricted spatially in 1981-1982. This report summarizes tagging during the 1981-1982 herring season and recoveries from all taggings.

In 1981-82, 68,000 tagged herring were released: 10,000 offshore the west coast of Vancouver Island in September, 20,000 in the lower Strait of Georgia in November and December, 18,000 in Barkley Sound in February and March, 18,000 on the north coast in March and April, and 2,000 in the upper Strait of Georgia in June.

There have been a total of 1,183 tag returns to June 30, 1982. During the 1981-1982 season, 939 recoveries were made. Of these, 639 had been at large for less than 3 mo, 215 at large between 3 mo and 1 yr, 48 were at large for 1 to 1.5 yr, 12 at large for 1.5 to 2 yr, 13 at large for more than 2 yr, and 12 at large for an unknown period of time.

Although tag returns have been below expectations, there have been sufficient recoveries to make the following tentative conclusions, some of which are preliminary pending more evidence from further tagging and other stock identification techniques.

Fish that spawn in the east coast of the Queen Charlotte Islands in Cumshewa Inlet, Laskeek Bay and Skincuttle Inlet comprise one stock that may also include Louscoone and Flamingo Inlet spawners. The late spawners of Skidegate Inlet may comprise another stock. Whether fish that spawn on the west coast of the Queen Charlottes, exclusive of Louscoone and Flamingo inlets, are a separate stock remains unknown.

The fish that spawn on the North Coast, between Portland Inlet and Kitkatla Channel, form a discrete stock unit that may be composed of two separate stocks. The Browning Entrance food fishery intercepts fish that spawn in the Queen Charlotte Islands and on the North Coast, north of Porcher Island, but not fish that spawn in Kitkatla Channel.

In the Central Coast, fisheries and recoveries have been too few to identify or discriminate between stocks but fish, in areas where there have been fisheries, have generally returned to spawn to the area of tagging in subsequent years.

There have been no significant roe or food fisheries in Johnstone

Strait but recoveries from permit fisheries suggest that: fish found in Deepwater Bay and contiguous waters in the late fall and early winter spawn mostly in Johnstone Strait while some migrate to the mainland coast of the Strait of Georgia to spawn; fish spawning on the mainland coast of the Strait of Georgia are found to inhabit the waters of Johnstone Strait in late spring and early summer; and fish found in and near the mainland inlets of Johnstone Strait in the spring are also found there later in the year and may, in the interval, migrate to spawn in the more southern portions of Johnstone Strait.

Fish that spawn in the Strait of Georgia along the Vancouver Island coastline and adjacent islands, except perhaps those that spawn in Area 18, constitute one stock. Most of these fish feed in the summer offshore the west coast of Vancouver Island, migrate into the lower Strait of Georgia in November to become part of the large aggregation of herring found in that area from November to January, and then disperse to spawn. The fall and winter aggregations also contain fish that spawn in the lower mainland waters off Point Roberts to Point Whitehorn, and probably fish that spawn in Area 18 and some of the fish that spawn on the upper mainland coast of the Strait of Georgia. Herring that are fished for food in the lower Strait of Georgia contain approximately equal proportions of Area 14 and Area 17 spawners. A mark-recapture estimate of 30,000 tons was made for stocks supporting this 6,000 tons food fishery.

The important question of whether fish that spawn in the major sounds and inlets of the west coast of Vancouver Island constitute individual stocks or whether they are part of a larger stock unit has not been answered because the tagging effort has been too small, the returns too few, and stock movements prior to spawning too complex. Of the fish congregated in Barkley Sound prior to spawning, about 10% do not spawn there but migrate to spawn in inlets to the north. Herring found offshore the west coast of Vancouver Island in the early fall are composed of about equal proportions of Strait of Georgia and west coast of Vancouver Island spawners.

Key words: Pacific herring, stock identification, tagging, migration patterns.

RÉSUMÉ

Haegele, C. W., C. E. Turner, L. Hop Wo, and D. C. Miller. 1982. Tagging of herring in British Columbia during the 1981-1982 herring season. Can. Ind. Rep. Fish. Aquat. Sci. 140: x + 65 p.

Nous avons marqué des harengs à l'aide d'étiquettes externes à ancrage afin de déterminer l'individualité et les migrations des stocks de la Colombie-Britannique. À sa mise en oeuvre en 1979-1980, le programme englobait toute la côte, mais l'envergure de l'étiquetage a été limitée en 1981-1982. Le présent rapport couvre l'étiquetage réalisé pendant la saison de pêche du hareng de 1981-1982 et les reprises faites à la suite de tous les étiquetages.

En 1981-1982, 68 000 harengs étiquetés ont été remis en liberté: 10 000 au large de la côte ouest de l'île Vancouver en septembre, 20 000 dans la partie inférieure du détroit de Géorgie en novembre et décembre, 18 000 dans la baie Barkley en février et mars, 18 000 sur la côte nord en mars et avril et 2 000 dans la partie supérieure du détroit de Géorgie en juin.

Au 30 juin 1982, 1 183 étiquettes avaient été récupérées. Au cours de la saison de 1981-1982, 939 reprises ont été réalisées. De ce total, 639 harengs étaient restés en liberté moins de trois mois; 215, de trois mois à un an; 48, de 1 an à 1 an et demi; 12, de 1 an et demi à 2 ans; 13, plus de 2 ans et 12, pour une période indéterminée.

Quoique les reprises aient été inférieures aux prévisions, leur ombre est assez élevé pour permettre la formulation des conclusions provisoires suivantes, dont quelques-unes seront étayées de plus de données, recueillies à l'aide d'étiquetages supplémentaires et d'autres techniques d'identification de stocks.

Les poissons qui fraient le long de la côte est des îles Reine-Charlotte dans l'inlet Cumshewa, la baie Laskeek et l'inlet Skincuttle constituent un stock qui peut aussi comprendre les géniteurs des inlets Louscoone et Flamingo. Les harengs qui se reproduisent plus tard dans l'inlet Skidegate forment peut-être un autre stock. On ne sait pas encore si les poissons qui fraient sur la côte ouest des îles Reine-Charlotte, sauf dans les inlets Lousconne et Flamingo, représentent un stock distinct.

Les reproducteurs présents sur la côte nord entre l'inlet Portland et le chenal Kitkatla constituent un groupe individuel qui peut être composé de deux stocks distincts. La pêche de subsistance effectuée dans l'entrée Browning intercepte les harengs qui fraient dans la région des îles Reine-Charlotte et de la côte nord, au nord de l'île Porcher, mais non ceux qui se reproduisent dans le chenal Kitkatla.

Dans la partie centrale de la côte, la pêche a été trop peu pratiquée et, par conséquent, les reprises trop peu nombreuses pour qu'on puisse identifier ou séparer les stocks mais, dans les régions où une pêche a été effectuée, les harengs sont généralement retournés frayer dans la zone où ils avaient été étiquetés.

Il n'y a eu aucune grande pêche de subsistance ou du hareng plein dans le détroit de Johnstone, mais les reprises au cours des pêches visées par un permis portent à croire que les poissons présents dans la baie Deepwater et les eaux voisines, à la fin de l'automne et au début de l'hiver, fraient principalement dans le détroit de Johnstone tandis qu'un certain nombre migre vers la côte continentale du détroit de Géorgie pour frayer; les reproducteurs qui fréquentent la côte continentale du détroit de Géorgie peuplent les eaux du détroit de Johnstone à la fin du printemps et au début de l'été; et les harengs habitant les inlets continentaux du détroit de Johnstone et les environs au printemps y sont aussi présents plus tard dans l'année et peuvent, dans l'intervalle, migrer vers les parties plus méridionales du détroit de Johnstone pour frayer.

Les harengs qui fraient dans le détroit de Géorgie le long de la côte de l'île Vancouver et des îles voisines, sauf peut-être ceux qui se reproduisent dans le secteur 18, constituent un seul stock. La majorité de ces poissons se nourrissent à l'été au large de la côte ouest de l'île Vancouver, migrent vers la partie inférieure du détroit de Géorgie en novembre pour se joindre aux nombreux harengs présents dans cette région de novembre à janvier, puis se dispersent pour frayer. Les groupes formés en automne et en hiver comptent aussi des poissons qui se reproduisent dans les eaux de la région de Vancouver au large de la pointe Roberts jusqu'à la pointe Whitehorn, et probablement des harengs qui fraient dans le secteur 18 et certains qui s'accouplent dans les eaux septentrionales du détroit de Géorgie. Une quantité à peu près égale de reproducteurs des secteurs 14 et 18 constituent les prises de harengs de consommation, dans la partie inférieure du détroit de Géorgie. D'après les résultats d'une étude d'étiquetage et de capture, on a évalué à 30 000 tonnes les stocks qui font l'objet de cette pêches de subsistance rapportant 6 000 tonnes.

Nous n'avons pu déterminer si les harengs qui fraient dans les principales baies et les principaux inlets de la côte ouest de l'île Vancouver constituent des stocks individuels ou s'ils appartiennent à un plus grand groupe, parce que l'effort d'étiquetage a été trop insuffisant, le nombre de reprises trop faible et le mouvement des stocks avant la fraie trop complexe. Environ 10 % des poissons qui se regroupent dans la baie Barkley avant la ponte migrent dans les inlets plus au nord pour frayer.

Les concentrations de harengs qui se trouvent au large de la côte ouest de l'île Vancouver au début de l'automne sont constituées de quantités à peu près égales de reproducteurs du détroit de Géorgie et de la côte ouest de l'île Vancouver.

Mots-clés: hareng du Pacifique, identification de stock, étiquetage, régimes migratoires

INTRODUCTION

In British Columbia herring were tagged with external anchor tags coast-wide in the spring of 1980 and 1981 and in some areas of the coast during the fall of 1979 and 1980 to provide information on the discreteness and migratory movements of herring stocks (Haegele 1981 and Haegele et al. 1982b). The program was not as successful as had been expected because, although tagging targets were mostly met, tag returns were below expectations. There were several potential reasons for this shortfall (Haegele et al. 1982b) and during the 1981-1982 herring season, which is the subject of this report, projects were initiated or completed to examine some of these. Concurrently with these projects, tagging was continued for some parts of the coast to address more limited questions of stock identity and movement. There were five "release" tagging projects carried out in 1981-1982.

In September 1981 fish were tagged offshore the west coast of Vancouver Island, in conjunction with hydroacoustic biomass estimate cruises, to determine where these fish are intercepted in fisheries and where they spawn.

In November and December of 1981 herring were tagged in the lower Strait of Georgia to determine which spawning stocks are intercepted during the food and bait fishery there and to determine with what fidelity these fish return to the Strait of Georgia in subsequent years.

In Barkley Sound herring were tagged in late February and early March to determine the dispersal of stocks found in the sound at that time to individual fisheries on the west coast of Vancouver Island during the same season and to determine to where these fish return in subsequent seasons.

Herring were tagged in March and April on the North Coast to determine whether fish spawning there are caught in the Browning Entrance food fishery and, also, to determine the discreteness of spawning stocks.

Juvenile herring were tagged in the upper Strait of Georgia in June, as part of a survey for bait fish, to obtain information on their movements.

METHODS

Herring were tagged with four types of external tags during the 1981-1982 season. The Floy anchor tag (Type FD-68BC) that has been used exclusively in previous seasons was also used during this season. It has a 42 mm long plastic portion, bearing the printed legend and tag number, which is connected to the toggle by a 15 mm long piece of monofilament. These tags were all colored international orange and are referred to as "Long-I". The same type of tag (Floy FD-68BC) but of different dimensions and in a variety

of colors was also used. The plastic portion, bearing the legend and tag number, was 32 mm long and was connected to the toggle by a piece of monofilament only 8 mm long and the tags are referred to as "Short". The following colors were used: yellow, white, orange, international orange, and pink. A few fish were tagged with Floy lock-on tags (Type FT-4) but these tags were found unsuitabe for herring and were used in only one tagging. A Floy "fine fabric" tag was used to tag some juvenile herring and the dimensions of this tag were similar to "Short" tags described above, except that the toggle was smaller and the needle used to implant these tags was shorter and of a finer gauge. All anchor tags were inserted with an applicator gun near the anterior margin of the dorsal fin. This location was a change from the position used in previous seasons when tags were inserted near the posterior margin of the dorsal fin. The change in tag location was made to enhance tag retention and on a suggestion from Floy Tag and Manufacturing, Inc. The lock-on tags were inserted through the dorsal musculature behind the dorsal fin.

Fish were obtained for tagging by seine and mid-water trawl. When seines were used, the fish were dipnetted from the seine into a plastic tub partially filled with seawater. Fish were taken individually, by hand, from the tub, tagged, and returned to the seine. The fish were released from the seine after tagging was completed. When tagging from trawls, the codend was unlaced along part of its length, the floating codend was secured to the side of the vessel and fish were dipnetted from it for tagging. Tagged fish were placed in tanks supplied with running seawater and then released together.

Samples of fish were obtained from most sets and tows, frozen, and shipped to the laboratory for the measurement of length, weight, and gonad weight and the determination of age, from scales, and sex.

Provisions for tag returns were made by advertising the tagging program with posters in fish processing plants and fisheries offices, at which locations postage pre-paid tag return envelopes were also made available. Up to February 1, 1982 a reward of $2 was paid to the finder. Thereafter, returned tags were entered in a prize draw and the first draw was made on July 16, 1982 when 16 prizes totalling $1,500 were awarded. The draw was made from 588 tags returned to June 30, 1982. Also, during the 1981-1982 season, technical personnel from the Pacific Biological Station or on contract to PBS visited processing plants during periods when herring were being handled to obtain tags from finders and to encourage processing plant employees to turn in recovered tags.

RESULTS

TAGGING

Tagging during the 1981-1982 season was restricted to offshore the west coast of Vancouver Island and the lower Strait of Georgia during the fall, to the North Coast and Barkley Sound during the spring and to the

upper Strait of Georgia during June. There were 67,878 tagged fish released, which are listed by tag number series in Table 1. Tagging locations are shown in Figs. 1 to 6 and tag releases are summarized by season and location in Tables 2 to 6.

West coast of Vancouver Island - offshore

Herring were tagged from midwater trawl tows made by the charter vessel SUN MAIDEN while the vessel was participating in echo-integration biomass estimates off the west coast of Vancouver Island. There were 10,391 tagged fish released from 12 tows (Table 2). Fish were released on Swiftsure Bank (four tows and 2,735 fish), in Nitinat Canyon (two tows and 1,673 fish), on the Prairie (one tow and 150 fish), on the Southeast Corner (two tows and 3,038 fish), in Loudon Canyon (one tow and 750 fish), and in Barkley Canyon (two tows and 2,045 fish). With 68,000 tons of fish estimated to have occupied these offshore waters at the time of tagging (Taylor pers. comm.), about one in 46,000 fish was tagged.

The age distribution of the fish in the tows from which tagging was done is shown in Table 7. Ten of the tows consisted of fish older than 3-yr. In eight of these tows, 3- and 4-yr-old fish were the most abundant while in two of these tows, 5- and 6-yr-old and older fish were most abundant. In two tows, fish were 2-yr-old or older with 2- and 3-yr-old fish the most abundant.

Strait of Georgia - Vancouver Island coast

Herring were tagged in the lower Strait of Georgia between November 9 and December 14, 1981 from 14 seine sets made by the Government of Canada vessels CALIGUS and WALKER ROCK (Table 3). There were 9,270 tagged herring released from eight sets made prior to the last Strait of Georgia food fishery of November 30 and 10,485 herring tagged and released from six sets made after the food fishery. Eleven of the tagging sets were made in the waters of Stuart Channel between Danger Reefs and Ruxton Pass and three sets were made in the upper waters of Trincomali Channel between Porlier Pass and Reid Island (Fig. 2). With an estimated 30,000 tons of herring in these waters at the time of tagging, about one in 11,000 fish was tagged.

The age composition of fish in the tagging sets show them to have been composed mostly of 3- and 4-yr-olds, with approximately 5% of the fish younger and 15% older (Table 8).

North Coast

Herring were tagged in the spring of 1982 on the North Coast from seine sets made by the charter vessel KARENORA II while the vessel was engaged in pre-season test-fishing and echosounding of herring stocks. There were 17,443 tagged herring released from 16 sets (Table 4). With an estimated 10,000 tons spawning on the north coast, approximately one in 4,000 herring was tagged. The tagging sets and releases were distributed as follows (Figs. 3 and 4): six sets (6,403 fish) in Portland Inlet, two sets

(1,878 fish) in Port Simpson, two sets (2,677 fish) in Edye Pass, and six sets (6,485 fish) in Kitkatla Channel.

In Portland Inlet, taggings were made between March 11 and 19 and biological samples showed fish in tagging sets to be about 60% 5-yr-old, 20% 4-yr-old, and the remainder 3-yr-old and 6-yr-old and older (Table 9). The fish were sexually mature with average G.I.'s for females between 0.19 to 0.26. Spawning occurred on March 18-19 in Portland Inlet and between March 27 and 31 in nearby Port Simpson. Fish tagged in Port Simpson on March 14 and 20 were also 60% 5-yr-old and sexually mature.

There were no biological samples processed for fish in tagging sets made in Edye Pass on April 4 and 7. Observations made at the time of tagging showed fish in the first set to be near sexual maturity while those in the second set were spent. Fish were reported to have spawned in nearby Hunts Inlet between April 1 and 6 and there may have been a small spawning in Butler Cove, the place of tagging.

The six tagging sets made in Kitkatla Channel (Fig. 4) between March 23 and 29 contained 80% 5-yr-old fish that were mostly fully mature with some spent fish present. Fish spawned in three waves in Kitkatla Channel in 1982: March 16 to 21, April 4 to 12, and April 18.

Barkley Sound

Herring were tagged in the spring of 1982 in Barkley Sound from seine sets made by the charter vessel PACIFIC HARVESTER while the vessel was engaged in pre-season test-fishing and echosounding of herring stocks. There were 17,860 tagged herring released from 13 sets made between February 20 and March 7 (Table 5; Fig. 5). With stocks in Barkley Sound estimated at 22,000 tons, about one in 9,000 fish was tagged.

The earliest tagging, on February 20 and 22, was done in and near Mayne Bay (three sets, 4,341 fish) and these fish were mostly 3- to 5-yr-old although 6-yr-old and older fish were also well-represented (Table 10). These fish were all mostly mature and the females had average G.I.'s of 0.20, hence were about 2 wk from spawning.

Near Chrow Islands, 6,446 herring were tagged from five sets made between February 23 and March 6. Fish from the February 23 set were 53% 6-yr-old and older and had low maturity while fish in the other sets, were mostly 3- to 5-yr-old and close to spawning with female average G.I.s of 0.27-0.29. Also in Loudon Channel, across from Chrow Islands, 849 tagged fish were released on February 27. These fish were mostly 3- and 4-yr-old.

In Imperial Eagle Channel, near the entrance at Pinnacle Rock, 6,224 tagged herring were released from four sets made between March 4 and 7. Fish from three of the sets were mostly 3- to 5-yr-old, while in one set they were mostly 2- to 4-yr-old. All the fish tagged were mature and quite close to spawning.

There were two major spawning waves in Barkley Sound in 1982, the first from March 6 to 11 and the second from March 24 to 30. There were also roe herring catches for charter payment made on March 11, 14 and 15 and there were roe fisheries on March 17 and 18.

Upper Strait of Georgia

In the middle of June, herring were tagged from seine sets made by the WALKER ROCK while the vessel was engaged in surveys for juvenile herring. In the Pender Harbour area, 1,982 tagged herring were released from four sets (Table 6; Fig. 6). These fish were mostly 1- and 2-yr-old and they were tagged with fine fabric tags (Table 11). Near Yaculta Village a further 447 tagged herring were released, but these were mostly 2- and 3-yr-old and were tagged with "Short" tags.

TAG RECOVERIES

The quality of the tag recovery information has been generally good. However, in the 1982 roe fishery, when the bulk of the catch was kept in freezer storage for a considerable period of time and processing for roe extraction was not completed until June, the incidence of tags with uncertain or unknown recovery location increased to 12% of the 553 tags returned. During the 1981-1982 season there were also a number of returns for which there was no information on the fishery of recapture.

Details of tag recoveries by date and locality of release and recapture, fishery, gear type, and tag type are published elsewhere (Haegele et al. 1982a). In this report, tag recoveries have been summarized by broader geographical locations (generally sections or areas), season of release and fishery of recapture. The seasons of release have been spring, which includes tagging done near spawning time, and fall, which includes tagging done between September and January. The fisheries of recapture are defined as follows:

Summer and fall	July 1 to the beginning of the food fishery (to December 1 in areas with no food fisheries).
Food	Fisheries for food and bait regulated by openings and closures.
Winter	From the end of the food fishery (from December 1 in areas with no food fisheries) to the beginning of the roe fishery (to the beginning of spawning in areas with no roe fishery).

Roe	Fisheries for roe regulated by openings and closures, spawn-on-kelp fishing, charter vessel catches of roe herring, and any other catches made during the spawning period in an area.
Spring	From the conclusion of spawning in an area to June 30.

There were 939 tag recoveries during the 1981-1982 season (Table 12). This compares favorably to the 188 and 56 tag recoveries during the 1980-1981 and 1979-1980 seasons, respectively. Of the tags recovered in 1981-1982, 639 had been at large for less than 3 mo, 215 had been at large between 3 mo and 1 yr, 48 were at large for 1 to 1.5 yr, 12 at large for 1.5 to 2 yr, 13 at large for more than 2 yr, and 12 at large for an unknown period of time.

Recoveries remain lower than projected and some of the potential causes for low returns have been addressed, with others under examination. Tag recovery trials during the 1981 food fishery showed that 25% of tags may be lost during the loading of the catch by pumps and 35% of tags in the catch can be expected to be recovered from the fishery (Haegele 1982). A single tag recovery trial during the 1982 roe fishery produced no returns. This is in contrast to the 85% recovery reported by Hay and Mitchell (1979). Further examination of recovery rates from the roe catch will have to be made. A gillnet study by Hay (1982) showed that fish 4-yr-old and younger are not retained by the net. The 1982 roe catch, including charter payment catches, was 45% by gillnet. Thirty-eight percent of fish tagged in the spring of 1981 and 45% of fish tagged in the fall of 1980 were 3-yr-old and younger. Hence, only 82% of fish still at large from 1980-1981 taggings would have been susceptible to capture during the 1982 roe fishery. The roe fisheries continue to be few in number and in many areas where fish have been released, there has been no subsequent fishery. If herring return to the same spawning grounds, this would result in fewer tag recoveries.

There has been tagging initiated during the current season to examine the effect of tag size on shedding and predation and the effect of tag color on predation. Results from these studies will not be available until next season. Visual observations of tagged fish show the short anchor tag to have much less "action" than the long anchor tag when the fish is swimming and this may reduce predation. The shedding of shorter tags may also be less than that of longer tags but tank studies that were initiated in the winter of 1981 are still in progress and results are not available.

Despite the still relatively small rate of return, there has been some valuable information obtained from tag returns to date and results are given and discussed below by regions of the coast. Tag recoveries are summarized in Tables 13 to 21.

Queen Charlotte Islands

On the west coast of the Queen Charlotte Islands there were two roe fisheries in 1982 that produced a hailed catch of 1,297 tons. Nearly one-half of that catch was processed at the B.C. Packers plant in Prince Rupert, from which plant no tags were returned during the processing of the roe catch. This may, in part, be the reason that no tags were recovered from the west coast of the Queen Charlottes, although 4,459 tagged fish were released there from seven sets in the spring of 1981. Nor were there any returns from 1,958 tagged fish released in May of 1981 in Skidegate Inlet, where there was no roe fishery in 1982.

The 1982 roe fishery in the lower east coast of the Queen Charlottes produced seven returns from a catch of 4,326 tons while a further seven tags were recovered from spawn-on-kelp ponds, in which approximately 1,000 tons of herring were impounded. Most of the fish in the spawn-on-kelp pond catch were released if alive or dumped if they died during the ponding operation. Hence, these catches were not processed and the recoveries were made by dipnetting the tagged fish from the ponds.

Tag returns from Queen Charlotte Islands taggings and fisheries totalled 39 to June 30, 1982 (Table 13). Roe fishery recoveries after 1 and 2 yr at large were mostly in the area of tagging, but fish tagged in one inlet have returned to adjacent inlets in subsequent years. For example, the 1982 Skincuttle Inlet roe fishery produced 12 returns of which seven were released in Skincuttle Inlet, three in adjacent Laskeek Bay, one in Cumshewa Inlet to the north, and one in adjacent Louscoone Inlet to the south, while none were recovered from Skidegate Inlet or west coast Queen Charlottes taggings. The limited evidence available would indicate that Cumshewa Inlet, Laskeek Bay and Skincuttle Inlet spawners comprise one stock that may also include Louscoone and Flamingo Inlet spawners, while the late spawners of Skidegate Inlet may comprise another stock. Whether fish that spawn on the west coast of the Charlottes, exclusive of Louscoone and Flamingo inlets, are a separate stock remains unknown. There has been no tagging of Naden Harbour spawners but evidence from timing of spawns and age structure would indicate that they may be a separate stock unit.

Some of the fish that spawn in the Queen Charlottes are found in Browning Entrance in November and December. There have been two roe fishery recoveries in Laskeek Bay of fish tagged in December in Browning Entrance and two food fishery recoveries in Browning Entrance of fish tagged in Rennell Sound and Cumshewa Inlet. A recovery in May in Kitkatla Inlet of a fish tagged 1 mo previous in Cumshewa Inlet was reported but not confirmed. Of note is a reported return from Laskeek Bay of a fish tagged in Hesquiat Harbour 2 yr before.

North Coast

There was a 2,003 tons food fishery in Browning Entrance in 1981 and no roe fishery on the north coast in 1982. There were 12 tag recoveries from the food fishery and 67 recoveries from spawn-on-kelp ponds and charter payment catches made during the roe season. There have been 107 tag returns from North Coast taggings and fisneries to June 30, 1982 (Table 14).

There have been only three recoveries during the roe season of fish at large for 1 yr and two of them showed returns to the area of tagging (Port Simpson-Big Bay and Kitkatla) while the third was recovered in Kitkatla and released in Port Simpson-Big Bay. The 1982 roe season was preceded by tagging throughout the North Coast. Taggings in Portland Inlet resulted in two recaptures in Alaska and 18 recaptures in Port Simpson-Big Bay during the 1982 roe season. Taggings in Port Simpson-Big Bay resulted in 13 returns from there. There were no returns from taggings immediately north of Porcher Island (Edye-Malacca sections) while taggings in Kitkatla Inlet produced 33 returns from there.

The 1981 food fishery had returns from 1981 spring taggings from Port Simpson-Big Bay (seven tags), Edye-Malacca (three tags) and Cumshewa (one tag) and one return from a tagging in Browning Entrance 1 yr earlier. From fish tagged in Browning Entrance in 1980, there were no other returns beyond the three returned during the 1981 roe fishery.

It would appear then that the North Coast spawners form a discrete stock unit since there have been no outside recoveries at spawning. Whether stocks are more discrete than at this level cannot be determined at the present low rate of tag returns from the limited fisheries. The Browning Entrance food fishery appears to intercept fish that spawn in the Queen Charlotte Islands, Port Simpson-Big Bay and in Edye-Malacca Pass but not fish that spawn in Kitkatla Inlet.

Central Coast

There were two areas in the Central Coast where roe fisheries were held in 1982. In Areas 6 and 7, 407 and 6,393 tons were taken, respectively. There was also a small food fishery in Area 6. Consequently, there have been virtually no returns from the substantial tagging done in Areas 8, 9 and 10 and only 21 tags have been returned from Central Coast taggings and fisheries (Table 15).

The Parker Passage fall food fishery of 249 tons produced two returns from fish tagged at nearby Larkin Point and Thistle Pass in the spring of 1981. Also in Area 6, the gut of a salmon caught in July near Kemano yielded the tag from a fish released in nearby Sue Channel the previous April. The Area 6 roe fishery brought no returns. The Area 7 roe fishery produced eight returns. Five of them had been at large for 1 yr and had been released in Area 7 (four tags) and Area 6 (one tag). Two fish had been at large for 2 yr. Of these, one had been tagged in Area 8, the other in the southern Strait of Georgia. Another fish that had been tagged in the Strait of Georgia, but in December of 1981, was also reported recovered in the Area 7 roe fishery. As well, a fish tagged in Area 7 at spawning in 1981 was recovered in the Barkley Sound roe fishery of 1982. Unless the latter three recoveries are indicative of poor recovery information, there may be a mixing of Central Coast spawners with spawners from further south. Obviously, more tags providing this kind of evidence will have to be recovered before such a conclusion may be drawn. The three spring and summer recoveries from Area 7 taggings would indicate that fish that spawn in Area 7 move south in the summer.

Johnstone Strait

There was only a 100 tons trawl food fishery in Johnstone Strait in 1981 and no roe fishery in 1982. Hence there were only four recoveries additional to the 81 reported last year from taggings and fisheries in Johnstone Strait (Table 16). These did not add to or change the conclusions drawn in last season's report (Haegele et al. 1982) that: fish found in Deepwater Bay and contiguous waters in the late fall and early winter spawn mostly in Johnstone Strait while some migrate to the mainland coast of the Strait of Georgia to spawn; fish spawning on the mainland coast of the Strait of Georgia are found to inhabit the waters of Johnstone Strait in late spring and early summer; and fish found in or near the mainland inlets of Johnstone Strait in the spring are also found there later in the year and may, in the interval, migrate to spawn in the more southern portions of Johnstone Strait.

Strait of Georgia - mainland coast

There were no food or roe fisheries along the mainland coast during the 1981-1982 or previous seasons and the tagging effort has been small for this part of the coast. There have been 14 tag returns from taggings and fisheries here, of which four were returned during the 1981-1982 season (Table 17).

A tag return from Stuart Island in September, 1981 from fish tagged in Area 15 at spawning in 1981 confirmed one of the conclusions drawn earlier (Haegele et al. 1982b) that some of the fish that spawn in Area 15 migrate to and from Johnstone Strait, where they reside for most of the year. However, also from fish tagged in Area 15 at spawning in 1981, there was one recovery in the 1981 Strait of Georgia food fishery, one recovery in the 1982 Area 14 roe fishery and one recovery in the 1982 Area 17S roe fishery. Hence, fish that spawn on the mainland coast of the Strait of Georgia also travel south to the Vancouver Island shore of the Strait of Georgia and may, in subsequent seasons, spawn there. The reverse, that fish that spawn along the Vancouver Island shore one year may spawn along the mainland shore in other years, may also apply but with no fisheries along the mainland shore, this cannot be demonstrated.

Since there has been no evidence from the limited, current tagging that fish that enter the Strait of Georgia through Johnstone Strait disperse to spawn along both the Vancouver Island shore and the mainland shore, the other plausible explanation for these Strait of Georgia returns is that fish that held in the lower Strait of Georgia in the fall and early winter of 1981 dispersed to spawn on both shorelines. Obviously, further tagging and tag returns are needed to answer these questions.

Strait of Georgia - Vancouver Island coast

There was a 6,074 tons food fishery (November 17-30, 1981) and, in March 1982, a 3,400 tons seine roe fishery in the lower Strait of Georgia (Area 17S) and a 6,000 tons gillnet roe fishery in Area 14. In addition, there were small special license catches off Victoria (Area 19) and some special license catches in Area 17S subsequent to the food fishery. There

were 526 tags returned from these catches and an additional tag was recovered from sport bait fishing during the 1981-1982 season. A further 17 tags were recovered during the 1981-1982 season from taggings made in the Strait of Georgia, ten of these had unknown recovery locations, while seven were recovered outside the Strait of Georgia. These 1981-1982 season recoveries account for 86% of the 635 recoveries made from all Strait of Georgia-Vancouver Island shore taggings and fisheries (Table 18).

The 306 tag returns from the 1981 food fishery of tags placed prior to the fishery were sufficient to attempt a Peterson mark-recapture estimate (Ricker 1975). It was necessary to adjust actual tag returns for tag recovery rates in processing plants (Haegele 1982) and an estimated 10% tagging mortality was assumed (Table 22). Population estimates were made from the three individual fishery openings (Fig. 7) and for taggings grouped by time into intervals (Table 23). Population estimates declined with subsequent fisheries, indicating that complete mixing required approximately 2 wk. Hence, the 30,000 tons estimate from the November 30 fishery opening and the November 9-12 taggings is probably best. Echosounder surveys throughout this period revealed no immigration or emigration from the area (D. Chalmers, pers. comm.). Echosounder estimates of herring in Stuart and Trincomali channels, conducted between December 14 and 16, by which time there may have been some immigration into the area, estimated the population size at 36,000 tons (R. Armstrong, pers. comm.). With the food fishery having removed 6,000 tons, the discrepancy in the two estimates is 12,000 tons.

In addition to the 306 tag recoveries discussed above, there were an additional 15 tags recovered from the 1981 food fishery. Five of these were from 1980 Area 17S fall taggings, three were from offshore the west coast of Vancouver Island taggings, there was one each from 1981 spring taggings in Area 15, Area 14, Area 17N, Area 17S and Area 24, and two returns from 1981 Area 18 spring tagging. The winter special license fisheries in Area 17S produced 28 tags from 1981 Area 17S fall taggings and one tag from an offshore 1981 fall tagging.

The Area 19 special license fishery produced five tags, two of which were placed in the fall of 1980 in Area 17S, two of which were placed in Area 24 in the spring of 1981, and one of which was placed offshore in the fall of 1981.

The 1982 gillnet roe fishery of 6,000 tons in Area 14 yielded 34 tags from 1981 fall taggings in Area 17S and the 3,400 tons seine roe fishery in Area 17S yielded 105 tags from the same taggings. Since fish tagged in the fall of 1981 in 17S were 80% 2- to 4-yr-olds, fish which are not intercepted by gillnets, and assuming similar exploitation rates for both fisheries, then it would appear that herring fished for food in Area 17S contain approximately equal proportions of Area 14 and Area 17 spawners.

The 1981 fall tagging produced two returns from research catches made on spawning fish in American waters. These returns, plus the two Washington placed tags recovered in the fall of 1981 in Area 17S, and the two Washington 1980 roe fishery recoveries of fish tagged in Areas 17S and 18 are evidence that fish spawning in lower mainland waters off Point Roberts to Point Whitehorn are found in Area 17S in the fall and winter.

Except for four recoveries in 1982, all tag returns from lower Strait of Georgia fall taggings have been in the Strait of Georgia. Exclusive of recaptures made prior to the subsequent roe fishery, six tags have been returned from 1979 fall taggings, 11 from 1980 fall taggings and 154 from 1981 fall taggings. Hence only 2.3% of returned tags have been from fisheries outside the Strait of Georgia. Three of the four tags returned from outside the Strait of Georgia were reported to have come from the Barkley Sound 1982 roe fishery and one tag from the 1982 Area 7 roe fishery.

In addition to the 44 returns from fall 1981 taggings, the 1982 roe fishery in Area 14 also produced four returns from spring 1981 tagging in Area 14, one return from spring 1980 tagging in Area 17N, two returns from spring 1980 tagging in Area 17S and one return from offshore fall 1981 tagging. The 1982 roe fishery in Area 17S produced, in addition to the 105 tags from fall 1981 tagging, one return from each of 1981 Area 15 spring, 1981 Area 14 spring, 1980 Area 17S fall, and 1980 offshore fall taggings, three returns from 1980 Area 18 fall taggings, and seven returns from 1981 offshore fall taggings. These returns, in addition to the ones from previous seasons, confirm that some of the fish that feed in the summer offshore the west coast of Vancouver Island migrate into the lower Strait of Georgia, beginning in November, to become part of the large aggregations of herring found in that area from November to January. Fish disperse from these aggregations to spawn throughout the Strait of Georgia. The evidence to date suggests that fish that spawn in the Strait of Georgia return only to the Strait of Georgia in subsequent seasons and there has been no evidence that fish that spawn in the Strait of Georgia have spawned somewhere else previously. Also, the Area 14, Area 17N and Area 17S spawners appear to belong to the same stock unit.

West coast of Vancouver Island - nearshore

There have been 304 tag returns from west coast of Vancouver Island nearshore taggings and fisheries, 265 of which have been during the 1981-1982 season (Table 19). This increase in tag returns over the previous season is largely a result of the extensive 1982 pre-roe fishery season tagging in Barkley Sound, from which 235 tags were returned. Fish were tagged in Barkley Sound from February 20 to March 7 to determine whether fish in the sound at that time will also spawn there. Of the 198 returned tags with known recovery locations, 85% were recovered in Barkley Sound, 12% in Clayoquot Sound and 3% in Esperanza Inlet (Table 24). Since there was no fishery on the first wave of spawners in Barkley Sound, herring were not fished in all major sounds and inlets and stock movements are relatively complex (Fig. 8), it is not possible to estimate with any degree of confidence the percentage of fish that emigrate from Barkley Sound just prior to spawning. However, it would appear that less than 10% of fish congregated in Barkley Sound prior to spawning do not also spawn there.

The west coast of Vancouver Island roe fisheries also produced 25 recoveries from taggings made prior to the spring of 1982. In Barkley Sound there were 12 recoveries from 1980 and 1981 offshore taggings, four recoveries each from spring 1980 and spring 1981 taggings in Barkley Sound, one recovery from a 1981 spring Area 7 tagging and three recoveries from 1981 lower Strait of Georgia fall taggings. There has been one other roe fishery recovery, in Area 27 in 1981, of fish tagged the previous fall in the lower

Strait of Georgia. This raises the interesting possibility that some of the fish that are found in the fall in the Strait of Georgia migrate to spawn on the west coast of Vancouver Island. The two recoveries made off Albert Head in the winter of 1981 of fish tagged the previous spring in Clayoquot Sound would also be explained by this migration pattern. In Clayoquot Sound there was one recovery of a fish released offshore the previous fall. In Esperanza Inlet there were two recoveries of fish tagged from the same set in Barkley Sound in 1980 and two recoveries from fall 1981 offshore taggings.

The tagging effort has been too small and tag returns too few on the west coast of Vancouver Island to answer the important question of whether spawners in the major sounds and inlets of the west coast constitute individual stocks or whether they are part of a larger stock unit.

West coast of Vancouver Island - offshore

There have been 47 tag returns from the two offshore the west coast of Vancouver Island fall tagging seasons of 1980 and 1981 (Table 20). Twenty-one tags were recovered in the entrance to or inside the Strait of Georgia. Seven of these were recovered within the first fall and winter after release (average of 59 days at large), ten were recovered in the first roe fishery after tagging (average of 174 days at large), three were recovered in the second food fishery after release (average of 428 days at large) and one was recovered in the second roe fishery after release (531 days at large). Thirteen tags were recovered in roe fisheries in Barkley Sound, ten of them in the first roe fishery after release (average of 179 days at large) and three in the second roe fishery after release (average of 540 days at large). Two tags were recovered in Clayoquot Sound, three tags in Nootka Sound and two tags in Esperanza Sound, all in the first roe fishery after release (average of 170 days at large). There were two tags recovered offshore, from salmon stomachs, 5 days after release. From these returns it would appear that the stocks found offshore in the early fall are composed of about equal proportions of Strait of Georgia and west coast of Vancouver Island spawners.

U.S.A. waters

There have been 8 Canadian placed tags recovered in American waters and 2 Washington placed tags recovered in Canadian waters (Table 21). Since there have been no roe fisheries in Washington in 1981 and 1982 and only limited tagging there, information on trans-boundary movement of stocks from tagging is limited to indications that fish spawning in lower mainland waters off Point Roberts to Point Whitehorn are found in Area 17S in the fall and winter and that fish that spawn on the west coast of Vancouver Island and in the Strait of Georgia are found offshore in American waters in summer. Two fish tagged in Portland Inlet in March, 1982 were recovered in the S.E. Alaska roe fishery shortly thereafter.

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Table 1. Herring tags inserted in British Columbia during the 1981-82 season - by tag number series.

Tag Series	Division	Section	Locality	Map Ref.	Tag Mth.	Tag Type	Date D/M/Y
H198001 - 199000	West Coast V.I.	Offshore Area 21	Swiftsure Bank	(A1)	TR	Long - I	09/09/81
H221000 - 221999	West Coast V.I.	Offshore Area 21	Swiftsure Bank	(A2)	TR	Long - I	09/09/81
H223500 - 223722	West Coast V.I.	Offshore Area 21	Nitinat Canyon	(A5)	TR	Long - I	11/09/81
H223723 - 223999	West Coast V.I.	Offshore Area 23	South East Corner	(A8)	TR	Long - I	10/09/81
H226000 - 226999	West Coast V.I.	Offshore Area 23	South East Corner	(A8)	TR	Long - I	10/09/81
H227000 - 227249	West Coast V.I.	Offshore Area 21	Nitinat Canyon	(A5)	TR	Long - I	11/09/81
H227250 - 227999	West Coast V.I.	Offshore Area 23	Loudoun Canyon	(A10)	TR	Long - I	13/09/81
H228000 - 229999	West Coast V.I.	Offshore Area 23	Barkley Canyon	(A11)	TR	Long - I	14/09/81
H241500 - 241574	West Coast V.I.	Offshore Area 21	Nitinat Canyon	(A6)	TR	Long - I	22/09/81
H241575 - 241624	West Coast V.I.	Offshore Area 23	Barkley Canyon	(A12)	TR	Long - I	15/09/81
H241625 - 241999	West Coast V.I.	Offshore Area 21	Nitinat Canyon	(A6)	TR	Long - I	22/09/81
H243000 - 243999	West Coast V.I.	Offshore Area 23	South East Corner	(A9)	TR	Long - I	16/09/81
H245000 - 245799	West Coast V.I.	Offshore Area 23	South East Corner	(A9)	TR	Long - I	16/09/81
H245800 - 245849	West Coast V.I.	Offshore Area 21	Prairie	(A7)	TR	Long - I	18/09/81
H245875 - 245899	West Coast V.I.	Offshore Area 23	South East Corner	(A9)	TR	Long - I	16/09/81
H245900 - 245999	West Coast V.I.	Offshore Area 21	Prairie	(A7)	TR	Long - I	18/09/81
H246000 - 246749	West Coast V.I.	Offshore Area 21	Nitinat Canyon	(A6)	TR	Long - I	22/09/81
H246750 - 246999	West Coast V.I.	Offshore Area 21	Swiftsure Bank	(A3)	TR	Long - I	24/09/81
H247000 - 247499	West Coast V.I.	Offshore Area 21	Swiftsure Bank	(A4)	TR	Long - I	24/09/81
H247500 - 248499	Strait of Georgia	Yellow Point	Ruxton Pass	(B3)	SN	Long - I	09/11/81
H248500 - 248999	Strait of Georgia	Yellow Point	Danger Reefs	(B11)	SN	Long - I	09/11/81
H249000 - 249999	Strait of Georgia	Other Area 17	Porlier Pass	(B1)	SN	Long - I	10/11/81
H260000 - 260999	Strait of Georgia	Other Area 17	Porlier Pass	(B2)	SN	Long - I	10/11/81
H261000 - 261999	Strait of Georgia	Yellow Point	Danger Reefs	(B12)	SN	Long - I	12/11/81
H262000 - 262999	Strait of Georgia	Yellow Point	Danger Reefs	(B13)	SN	Long - I	16/11/81
H263000 - 264999	Strait of Georgia	Yellow Point	Ruxton Pass	(B4)	SN	Long - I	23/11/81
H265300 - 266999	Strait of Georgia	Yellow Point	Reid Island	(B14)	SN	Long - I	24/11/81
H267000 - 268999	Strait of Georgia	Yellow Point	Ruxton Pass	(B5)	SN	Long - I	02/12/81

Table 1 (con'd)

Tag Series	Division	Section	Locality	Map Ref.	Tag Mth.	Tag Type	Date D/M/Y
H269000 - 269999	Strait of Georgia	Yellow Point	Ruxton Pass	(B6)	SN	Long - I	02/12/81
H271000 - 271999	Strait of Georgia	Yellow Point	Ruxton Pass	(B7)	SN	Long - I	07/12/81
H272000 - 273999	Strait of Georgia	Yellow Point	Ruxton Pass	(B8)	SN	Long - I	07/12/81
H274000 - 275499	Strait of Georgia	Yellow Point	Ruxton Pass	(B9)	SN	Long - I	14/12/81
H275500 - 276999	Strait of Georgia	Yellow Point	Ruxton Pass	(B10)	SN	Long - I	14/12/81
H277000 - 277999	Strait of Georgia	Yellow Point	Ruxton Pass	(B6)	SN	Long - I	02/12/81
H278000 - 278499	Strait of Georgia	Yellow Point	Ruxton Pass	(B10)	SN	Long - I	14/12/81
H278500 - 278599	West Coast V.I.	Mayne Bay	Lyall Point	(E11)	DT	Long - I	20/02/82
H278600 - 278999	West Coast V.I.	Mayne Bay	Lyall Point	(E11)	SN	Long - I	20/02/82
H279000 - 279499	West Coast V.I.	Mayne Bay	Lyall Point	(E12)	SN	Long - I	20/02/82
H279500 - 279599	West Coast V.I.	Mayne Bay	Lyall Point	(E12)	DT	Long - I	20/02/82
H279600 - 279999	West Coast V.I.	Mayne Bay	Lyall Point	(E12)	SN	Long - I	20/02/82
H280000 - 280099	West Coast V.I.	Mayne Bay	Mayne Bay	(E13)	DT	Long - I	22/02/82
H280100 - 280499	West Coast V.I.	Mayne Bay	Mayne Bay	(E13)	SN	Long - I	22/02/82
H280500 - 280599	West Coast V.I.	Mayne Bay	Mayne Bay	(E13)	DT	Long - I	22/02/82
H280600 - 280999	West Coast V.I.	Mayne Bay	Mayne Bay	(E13)	SN	Long - I	22/02/82
H281000 - 281099	West Coast V.I.	Macoah Pass	Chrow Islands	(E6)	DT	Long - I	23/02/82
H281100 - 281499	West Coast V.I.	Macoah Pass	Chrow Islands	(E6)	SN	Long - I	23/02/82
H281500 - 281599	West Coast V.I.	Other Area 23	Loudoun Channel	(E1)	DT	Long - I	27/02/82
H281600 - 281999	West Coast V.I.	Other Area 23	Loudoun Channel	(E1)	SN	Long - I	27/02/82
H282000 - 282099	West Coast V.I.	Macoah Pass	Chrow Islands	(E7)	DT	Long - I	03/03/82
H282100 - 282499	West Coast V.I.	Macoah Pass	Chrow Islands	(E7)	SN	Long - I	03/03/82
H282500 - 282999	West Coast V.I.	Macoah Pass	Chrow Islands	(E8)	SN	Long - I	03/03/82
H283000 - 283099	West Coast V.I.	Macoah Pass	Chrow Islands	(E8)	DT	Long - I	03/03/82
H283100 - 283499	West Coast V.I.	Macoah Pass	Chrow Islands	(E8)	SN	Long - I	03/03/82
H283500 - 283599	West Coast V.I.	Other Area 23	Pinnacle Rock	(E2)	DT	Long - I	04/03/82
H283600 - 283999	West Coast V.I.	Other Area 23	Pinnacle Rock	(E2)	SN	Long - I	04/03/82
H284000 - 284099	West Coast V.I.	Other Area 23	Pinnacle Rock	(E2)	DT	Long - I	04/03/82

Table 1 (con'd)

Tag Series	Division	Section	Locality	Map Ref.	Tag Mth.	Tag Type	Date D/M/Y
H284100 - 284499	West Coast V.I.	Other Area 23	Pinnacle Rock	(E2)	SN	Long - I	04/03/82
H284500 - 284599	West Coast V.I.	Other Area 23	Pinnacle Rock	(E3)	DT	Long - I	04/03/82
H284600 - 284999	West Coast V.I.	Other Area 23	Pinnacle Rock	(E3)	SN	Long - I	04/03/82
H285000 - 285099	West Coast V.I.	Other Area 23	Pinnacle Rock	(E3)	DT	Long - I	04/03/82
H285100 - 285499	West Coast V.I.	Other Area 23	Pinnacle Rock	(E3)	SN	Long - I	04/03/82
H285500 - 285599	West Coast V.I.	Macoah Pass	Chrow Islands	(E9)	DT	Long - I	05/03/82
H285600 - 285999	West Coast V.I.	Macoah Pass	Chrow Islands	(E9)	SN	Long - I	05/03/82
H286000 - 286099	West Coast V.I.	Macoah Pass	Chrow Islands	(E9)	DT	Long - I	05/03/82
H286100 - 286499	West Coast V.I.	Macoah Pass	Chrow Islands	(E9)	SN	Long - I	05/03/82
H286500 - 286599	West Coast V.I.	Macoah Pass	Chrow Islands	(E10)	DT	Long - I	06/03/82
H286600 - 286999	West Coast V.I.	Macoah Pass	Chrow Islands	(E10)	SN	Long - I	06/03/82
H287000 - 287099	West Coast V.I.	Other Area 23	Pinnacle Rock	(E4)	DT	Long - I	06/03/82
H287100 - 287499	West Coast V.I.	Other Area 23	Pinnacle Rock	(E4)	SN	Long - I	06/03/82
H287500 - 287599	West Coast V.I.	Other Area 23	Pinnacle Rock	(E4)	DT	Long - I	06/03/82
H287600 - 287999	West Coast V.I.	Other Area 23	Pinnacle Rock	(E4)	SN	Long - I	06/03/82
H289000 - 289099	West Coast V.I.	Macoah Pass	Chrow Islands	(E10)	DT	Long - I	06/03/82
H289100 - 289499	West Coast V.I.	Macoah Pass	Chrow Islands	(E10)	SN	Long - I	06/03/82
H289500 - 289599	West Coast V.I.	Other Area 23	Pinnacle Rock	(E5)	DT	Long - I	07/03/82
H289600 - 289999	West Coast V.I.	Other Area 23	Pinnacle Rock	(E5)	SN	Long - I	07/03/82
H290000 - 290099	North Coast	Edye Passage	Butler Cove	(D1)	DT	Long - I	04/04/82
H290100 - 290499	North Coast	Edye Passage	Butler Cove	(D1)	SN	Long - I	04/04/82
H290500 - 290599	North Coast	Edye Passage	Butler Cove	(D1)	DT	Long - I	04/04/82
H290600 - 290999	North Coast	Edye Passage	Butler Cove	(D1)	SN	Long - I	04/04/82
H291000 - 291099	North Coast	Edye Passage	Butler Cove	(D2)	DT	Long - I	07/04/82
H291100 - 291499	North Coast	Edye Passage	Butler Cove	(D2)	SN	Long - I	07/04/82
H303000 - 303099	North Coast	Portland Inlet	Somerville Bay	(C2)	DT	Long - I	12/03/82
H303100 - 303499	North Coast	Portland Inlet	Somerville Bay	(C2)	SN	Long - I	12/03/82
H303500 - 303599	North Coast	Portland Inlet	Somerville Bay	(C2)	DT	Long - I	12/03/82
H303600 - 303999	North Coast	Portland Inlet	Somerville Bay	(C2)	SN	Long - I	12/03/82

Table 1 (con'd)

Tag Series	Division	Section	Locality	Map Ref.	Tag Mth.	Tag Type	Date D/M/Y
H304000 - 304099	North Coast	Portland Inlet	Wales Passage	(C4)	DT	Long - I	13/03/82
H304100 - 304499	North Coast	Portland Inlet	Wales Passage	(C4)	SN	Long - I	13/03/82
H304500 - 304599	North Coast	Portland Inlet	Union Inlet	(C6)	DT	Long - I	14/03/82
H304600 - 304999	North Coast	Portland Inlet	Union Inlet	(C6)	SN	Long - I	14/03/82
H305000 - 305099	North Coast	Port Simpson	Birnie Island	(C7)	DT	Long - I	14/03/82
H305100 - 305199	North Coast	Portland Inlet	Somerville Bay	(C3)	DT	Long - I	18/03/82
H305200 - 305299	North Coast	Kitkatla Channel	Gurd Island	(D7)	DT	Long - I	29/03/82
H305300 - 305999	North Coast	Kitkatla Channel	Gurd Island	(D7)	SN	Long - I	29/03/82
H306000 - 306099	North Coast	Kitkatla Channel	Robert Island	(D3)	DT	Long - I	23/03/82
H306100 - 306499	North Coast	Kitkatla Channel	Robert Island	(D3)	SN	Long - I	23/03/82
H306500 - 306599	North Coast	Kitkatla Channel	Snass Point	(D4)	DT	Long - I	23/03/82
H306600 - 306999	North Coast	Kitkatla Channel	Snass Point	(D4)	SN	Long - I	23/03/82
H307000 - 307099	North Coast	Portland Inlet	Wales Passage	(C5)	DT	Long - I	19/03/82
H307100 - 307499	North Coast	Portland Inlet	Wales Passage	(C5)	SN	Long - I	19/03/82
H307500 - 307599	North Coast	Port Simpson	Maskelyne Island	(C8)	DT	Long - I	20/03/82
H307600 - 307999	North Coast	Port Simpson	Maskelyne Island	(C8)	SN	Long - I	20/03/82
H308000 - 308099	North Coast	Kitkatla Channel	Absalom Island	(D5)	DT	Long - I	27/03/82
H308100 - 308499	North Coast	Kitkatla Channel	Absalom Island	(D5)	SN	Long - I	27/03/82
H308500 - 308599	North Coast	Kitkatla Channel	Gurd Island	(D6)	DT	Long - I	28/03/82
H308600 - 308999	North Coast	Kitkatla Channel	Gurd Island	(D6)	SN	Long - I	28/03/82
H309000 - 309099	North Coast	Kitkatla Channel	Ness Islands	(D8)	DT	Long - I	29/03/82
H309100 - 309499	North Coast	Kitkatla Channel	Ness Islands	(D8)	SN	Long - I	29/03/82
H309500 - 309599	North Coast	Kitkatla Channel	Ness Islands	(D8)	DT	Long - I	29/03/82
H309600 - 309999	North Coast	Kitkatla Channel	Ness Islands	(D8)	SN	Long - I	29/03/82
H310000 - 310099	Strait of Georgia	Yellow Point	Danger Reefs	(B13)	SN	Lockon-I	16/11/81

Table 1 (con'd)

Tag Series	Division	Section	Locality	Map Ref.	Tag Mth.	Tag Type	Date D/M/Y
H311000 - 311099	West Coast V.I.	Mayne Bay	Mayne Bay	(E13)	DT	Short- I	22/02/82
H311100 - 311499	West Coast V.I.	Mayne Bay	Mayne Bay	(E13)	SN	Short- I	22/02/82
H311500 - 311599	West Coast V.I.	Mayne Bay	Mayne Bay	(E13)	DT	Short- I	22/02/82
H311600 - 311999	West Coast V.I.	Mayne Bay	Mayne Bay	(E13)	SN	Short- I	22/02/82
H312000 - 312099	West Coast V.I.	Other Area 23	Pinnacle Rock	(E3)	DT	Short- I	04/03/82
H312100 - 312499	West Coast V.I.	Other Area 23	Pinnacle Rock	(E3)	SN	Short- I	04/03/82
H312500 - 312599	West Coast V.I.	Macoah Pass	Chrow Islands	(E9)	DT	Short- I	05/03/82
H312600 - 312999	West Coast V.I.	Macoah Pass	Chrow Islands	(E9)	SN	Short- I	05/03/82
H317000 - 317099	North Coast	Portland Inlet	Somerville Bay	(C3)	DT	Short- I	18/03/82
H317100 - 317999	North Coast	Portland Inlet	Somerville Bay	(C3)	SN	Short- I	18/03/82
H318000 - 318099	North Coast	Edye Passage	Butler Cove	(D1)	DT	Short- I	04/04/82
H318100 - 318499	North Coast	Edye Passage	Butler Cove	(D1)	SN	Short- I	04/04/82
H318500 - 318599	North Coast	Edye Passage	Butler Cove	(D2)	DT	Short- I	07/04/82
H318600 - 318999	North Coast	Edye Passage	Butler Cove	(D2)	SN	Short- I	07/04/82
H321000 - 321499	West Coast V.I.	Mayne Bay	Lyall Point	(E12)	SN	Short- O	20/02/82
H321500 - 321599	West Coast V.I.	Macoah Pass	Chrow Islands	(E7)	DT	Short- O	03/03/82
H321600 - 321699	West Coast V.I.	Macoah Pass	Chrow Islands	(E7)	SN	Short- O	03/03/82
H321700 - 321799	West Coast V.I.	Macoah Pass	Chrow Islands	(E8)	SN	Short- O	03/03/82
H321800 - 321899	West Coast V.I.	Macoah Pass	Chrow Islands	(E7)	SN	Short- O	03/03/82
H321900 - 321999	West Coast V.I.	Macoah Pass	Chrow Islands	(E8)	SN	Short- O	03/03/82
H322000 - 322099	West Coast V.I.	Macoah Pass	Chrow Islands	(E9)	DT	Short- O	05/03/82
H322100 - 322499	West Coast V.I.	Macoah Pass	Chrow Islands	(E9)	SN	Short- O	05/03/82
H322500 - 322599	West Coast V.I.	Other Area 23	Pinnacle Rock	(E5)	DT	Short- O	07/03/82
H322600 - 322999	West Coast V.I.	Other Area 23	Pinnacle Rock	(E5)	SN	Short- O	07/03/82
H327000 - 327099	North Coast	Port Simpson	Birnie Island	(C7)	DT	Short- O	14/03/82
H327100 - 327999	North Coast	Port Simpson	Birnie Island	(C7)	SN	Short- O	14/03/82
H331000 - 331099	West Coast V.I.	Mayne Bay	Lyall Point	(E11)	DT	Short- Y	20/02/82
H331100 - 331499	West Coast V.I.	Mayne Bay	Lyall Point	(E11)	SN	Short- Y	20/02/82

Table 1 (con'd)

Tag Series	Division	Section	Locality	Map Ref.	Tag Mth.	Tag Type	Date D/M/Y
H331500 - 331599	West Coast V.I.	Macoah Pass	Chrow Islands	(E6)	DT	Short- Y	23/02/82
H331600 - 331999	West Coast V.I.	Macoah Pass	Chrow Islands	(E6)	SN	Short- Y	23/02/82
H332000 - 332099	West Coast V.I.	Macoah Pass	Chrow Islands	(E8)	DT	Short- Y	03/03/82
H332100 - 332499	West Coast V.I.	Macoah Pass	Chrow Islands	(E8)	SN	Short- Y	03/03/82
H332500 - 332599	West Coast V.I.	Other Area 23	Pinnacle Rock	(E2)	DT	Short- Y	04/03/82
H332600 - 332999	West Coast V.I.	Other Area 23	Pinnacle Rock	(E2)	SN	Short- Y	04/03/82
H337000 - 337099	North Coast	Portland Inlet	Wales Passage	(C4)	DT	Short- Y	13/03/82
H337100 - 337499	North Coast	Portland Inlet	Wales Passage	(C4)	SN	Short- Y	13/03/82
H337500 - 337599	North Coast	Portland Inlet	Union Inlet	(C6)	DT	Short- Y	14/03/82
H337600 - 337999	North Coast	Portland Inlet	Union Inlet	(C6)	SN	Short- Y	14/03/82
H338000 - 338099	North Coast	Kitkatla Channel	Absalom Island	(D5)	DT	Short- Y	27/03/82
H338100 - 338499	North Coast	Kitkatla Channel	Absalom Island	(D5)	SN	Short- Y	27/03/82
H338500 - 338599	North Coast	Kitkatla Channel	Gurd Island	(D6)	DT	Short- Y	28/03/82
H338600 - 338999	North Coast	Kitkatla Channel	Gurd Island	(D6)	SN	Short- Y	28/03/82
H341000 - 341099	West Coast V.I.	Mayne Bay	Lyall Point	(E12)	DT	Short- W	20/02/82
H341100 - 341499	West Coast V.I.	Mayne Bay	Lyall Point	(E12)	SN	Short- W	20/02/82
H341500 - 341599	West Coast V.I.	Other Area 23	Loudoun Channel	(E1)	DT	Short- W	27/02/82
H341600 - 341999	West Coast V.I.	Other Area 23	Loudoun Channel	(E1)	SN	Short- W	27/02/82
H342000 - 342099	West Coast V.I.	Other Area 23	Pinnacle Rock	(E2)	DT	Short- W	04/03/82
H342100 - 342499	West Coast V.I.	Other Area 23	Pinnacle Rock	(E2)	SN	Short- W	04/03/82
H342500 - 342599	West Coast V.I.	Other Area 23	Pinnacle Rock	(E3)	DT	Short- W	04/03/82
H342600 - 342999	West Coast V.I.	Other Area 23	Pinnacle Rock	(E3)	SN	Short- W	04/03/82
H343050 - 343549	Strait of Georgia	Heriot Bay	Yaculta Village	(F1)	SN	Short- W	17/06/82
H347000 - 347999	North Coast	Portland Inlet	Steamer Pass	(C1)	SN	Short- W	11/03/82
H348000 - 348099	North Coast	Portland Inlet	Wales Passage	(C5)	DT	Short- W	19/03/82
H348100 - 348499	North Coast	Portland Inlet	Wales Passage	(C5)	SN	Short- W	19/03/82
H348500 - 348599	North Coast	Port Simpson	Maskelyne Island	(C8)	DT	Short- W	20/03/82
H348600 - 348999	North Coast	Port Simpson	Maskelyne Island	(C8)	SN	Short- W	20/03/82
H349000 - 349099	North Coast	Kitkatla Channel	Ness Islands	(D8)	DT	Short- W	29/03/82

Table 1 (con'd)

Tag Series	Division	Section	Locality	Map Ref.	Tag Mth.	Tag Type	Date D/M/Y
H349100 - 349499	North Coast	Kitkatla Channel	Ness Islands	(D8)	SN	Short- W	29/03/82
H349500 - 349599	North Coast	Edye Passage	Butler Cove	(D1)	DT	Short- W	04/04/82
H349600 - 349999	North Coast	Edye Passage	Butler Cove	(D1)	SN	Short- W	04/04/82
H351000 - 351099	West Coast V.I.	Other Area 23	Pinnacle Rock	(E4)	DT	Short- P	06/03/82
H351100 - 351499	West Coast V.I.	Other Area 23	Pinnacle Rock	(E4)	SN	Short- P	06/03/82
H351500 - 351599	West Coast V.I.	Other Area 23	Pinnacle Rock	(E4)	DT	Short- P	06/03/82
H351600 - 351999	West Coast V.I.	Other Area 23	Pinnacle Rock	(E4)	SN	Short- P	06/03/82
H352000 - 352099	West Coast V.I.	Macoah Pass	Chrow Islands	(E10)	DT	Short- P	06/03/82
H352100 - 352499	West Coast V.I.	Macoah Pass	Chrow Islands	(E10)	SN	Short- P	06/03/82
H352500 - 352599	West Coast V.I.	Macoah Pass	Chrow Islands	(E10)	DT	Short- P	06/03/82
H352600 - 352999	West Coast V.I.	Macoah Pass	Chrow Islands	(E10)	SN	Short- P	06/03/82
H357000 - 357099	North Coast	Portland Inlet	Somerville Bay	(C2)	DT	Short- P	12/03/82
H357100 - 357499	North Coast	Portland Inlet	Somerville Bay	(C2)	SN	Short- P	12/03/82
H357500 - 357599	North Coast	Portland Inlet	Somerville Bay	(C2)	DT	Short- P	12/03/82
H357600 - 357999	North Coast	Portland Inlet	Somerville Bay	(C2)	SN	Short- P	12/03/82
H358000 - 358099	North Coast	Kitkatla Channel	Robert Island	(D3)	DT	Short- P	23/03/82
H358100 - 358499	North Coast	Kitkatla Channel	Robert Island	(D3)	SN	Short- P	23/03/82
H358500 - 358599	North Coast	Kitkatla Channel	Snass Point	(D4)	DT	Short- P	23/03/82
H358600 - 358999	North Coast	Kitkatla Channel	Snass Point	(D4)	SN	Short- P	23/03/82
H359000 - 359099	North Coast	Kitkatla Channel	Gurd Island	(D7)	DT	Short- P	29/03/82
H359100 - 359499	North Coast	Kitkatla Channel	Gurd Island	(D7)	SN	Short- P	29/03/82
H359500 - 359599	North Coast	Kitkatla Channel	Ness Islands	(D8)	DT	Short- P	29/03/82
H359600 - 359999	North Coast	Kitkatla Channel	Ness Islands	(D8)	SN	Short- P	29/03/82
H990000 - 990499	Strait of Georgia	Pender Harbour	Francis Point	(F2)	SN	Fine - I	10/06/82
H990500 - 990999	Strait of Georgia	Pender Harbour	Francis Point	(F3)	SN	Fine - I	10/06/82
H991000 - 991499	Strait of Georgia	Pender Harbour	Francis Point	(F4)	SN	Fine - I	11/06/82
H991500 - 991999	Strait of Georgia	Pender Harbour	Francis Point	(F5)	SN	Fine - I	11/06/82

Table 2. Herring tag releases offshore the west coast of Vancouver Island in the fall of 1981.

Section	Locality	Map Ref.	Date D/M/Y	Tons in Tow	Tag Type	Fish Rel.
	WEST COAST VANCOUVER ISLAND DIVISION (offshore)					
Offshore Area 21	Swiftsure Bank	(A1)	09/09/81	4	Long - I	992
	Swiftsure Bank	(A2)	09/09/81	3	Long - I	993
	Swiftsure Bank	(A3)	24/09/81	1.7	Long - I	250
	Swiftsure Bank	(A4)	24/09/81	0.5	Long - I	500
	Nitinat Canyon	(A5)	11/09/81	1	Long - I	473
	Nitinat Canyon	(A6)	22/09/81	4	Long - I	1200
	Prairie	(A7)	18/09/81	3	Long - I	150
Offshore Area 23	South East Corner	(A8)	10/09/81	3	Long - I	1216
	South East Corner	(A9)	16/09/81	9	Long - I	1822
	Loudoun Canyon	(A10)	13/09/81	0.5	Long - I	750
	Barkley Canyon	(A11)	14/09/81	15	Long - I	1995
	Barkley Canyon	(A12)	15/09/81	1	Long - I	50
Total for Division			12 tows			10391

Table 3. Herring tag releases in the lower Strait of Georgia in the fall of 1981.

Section	Locality	Map Ref.	Date D/M/Y	Tons in Set	Tag Type	Fish Rel.
		STRAIT OF GEORGIA DIVISION				
Other Area 17	Porlier Pass	(B1)	10/11/81	10	Long - I	998
	Porlier Pass	(B2)	10/11/81	25	Long - I	987
Yellow Point	Ruxton Pass	(B3)	09/11/81	2	Long - I	999
	Ruxton Pass	(B4)	23/11/81	8	Long - I	1998
	Ruxton Pass	(B5)	02/12/81	10	Long - I	1997
	Ruxton Pass	(B6)	02/12/81	1.5	Long - I	1998
	Ruxton Pass	(B7)	07/12/81	0.5	Long - I	996
	Ruxton Pass	(B8)	07/12/81	1.5	Long - I	1998
	Ruxton Pass	(B9)	14/12/81	5	Long - I	1498
	Ruxton Pass	(B10)	14/12/81	15	Long - I	1998
	Danger Reefs	(B11)	09/11/81	25	Long - I	499
	Danger Reefs	(B12)	12/11/81	0.5	Long - I	998
	Danger Reefs	(B13)	16/11/81	2	Long - I	996
					Lockon-I	99
	Reid Island	(B14)	24/11/81	3.5	Long - I	1696
Total for Division			14 sets			19755

Table 4. Herring tag releases on the North Coast in the spring of 1982.

Locality	Map Ref	Date D/M/Y	Tons in Set	Single Tagging							Double Tagging						Fish Rel.
				Long	Short - by colour						Long	Short - by colour					
				I	Y	W	O	I	P	All	I	Y	W	O	I	P	
Portland Inlet (section)																	
Steamer Pass	(C1)	11/03/82	250	-	-	996	-	-	-	996	-	-	-	-	-	-	996
Somerville Bay	(C2)	12/03/82	160	784	-	-	-	-	782	782	196	-	-	-	-	196	1762
Somerville Bay	(C3)	18/03/82	250	-	-	-	-	861	-	861	99	-	-	-	99	-	960
Wales Passage	(C4)	13/03/82	25	395	400	-	-	-	-	400	98	98	-	-	-	-	893
Wales Passage	(C5)	19/03/82	150	399	-	399	-	-	-	399	97	-	97	-	-	-	895
Union Inlet	(C6)	14/03/82	40	398	400	-	-	-	-	400	99	99	-	-	-	-	897
Port Simpson (section)																	
Birnie Island	(C7)	14/03/82	50	-	-	-	883	-	-	883	99	-	-	99	-	-	982
Maskelyne Island	(C8)	20/03/82	400	399	-	399	-	-	-	399	98	-	98	-	-	-	896
Edye Passage (section)																	
Butler Cove	(D1)	04/04/82	150	798	-	397	-	400	-	797	195	-	97	-	98	-	1790
Butler Cove	(D2)	07/04/82	5	393	-	-	-	394	-	394	100	-	-	-	100	-	887
Kitkatla Channel (section)																	
Robert Island	(D3)	23/03/82	10	372	-	-	-	-	376	376	93	-	-	-	-	93	841
Snass Point	(D4)	23/03/82	85	400	-	-	-	-	394	394	99	-	-	-	-	99	893
Absalom Island	(D5)	27/03/82	10	398	397	-	-	-	-	397	97	97	-	-	-	-	892
Gurd Island	(D6)	28/03/82	15	393	395	-	-	-	-	395	99	99	-	-	-	-	887
Gurd Island	(D7)	29/03/82	75	700	-	-	-	-	400	400	100	-	-	-	-	100	1200
Ness Islands	(D8)	29/03/82	20	789	-	397	-	-	395	792	191	-	96	-	-	95	1772
Total - North Coast		16 sets		6618	1592	2588	883	1655	2347	9065	1760	393	388	99	297	583	17443

Table 5. Herring tag releases in Barkley Sound in the spring of 1982.

Locality	Map Ref	Date D/M/Y	Tons in Set	Single Tagging							Double Tagging						Fish Rel.
				Long	Short - by colour						Long	Short - by colour					
				I	Y	W	O	I	P	All	I	Y	W	O	I	P	
Other Area 23 (section)																	
Loudoun Channel	(E1)	27/02/82	15	384	-	369	-	-	-	369	96	-	96	-	-	-	849
Pinnacle Rock	(E2)	04/03/82	77	783	397	393	-	-	-	790	197	98	99	-	-	-	1770
Pinnacle Rock	(E3)	04/03/82	75	788	-	399	-	399	-	798	197	-	98	-	99	-	1783
Pinnacle Rock	(E4)	06/03/82	100	798	-	-	-	-	797	797	192	-	-	-	-	192	1787
Pinnacle Rock	(E5)	07/03/82	5	398	-	-	394	-	-	394	92	-	-	92	-	-	884
Macoah Pass (section)																	
Chrow Islands	(E6)	23/02/82	0.5	386	384	-	-	-	-	384	89	89	-	-	-	-	859
Chrow Islands	(E7)	03/03/82	150	301	-	-	108	-	-	108	23	-	-	23	-	-	432
Chrow Islands	(E8)	03/03/82		893	397	-	200	-	-	597	96	96	-	-	-	-	1586
Chrow Islands	(E9)	05/03/82	100	796	-	-	397	397	-	794	200	-	-	100	100	-	1790
Chrow Islands	(E10)	06/03/82	250	792	-	-	-	-	797	797	190	-	-	-	-	190	1779
Mayne Bay (section)																	
Lyall Point	(E11)	20/02/82	50	393	391	-	-	-	-	391	96	96	-	-	-	-	880
Lyall Point	(E12)	20/02/82	50	769	-	397	424	-	-	821	95	-	95	-	-	-	1685
Mayne Bay	(E13)	22/02/82	30	789	-	-	-	798	-	798	189	-	-	-	189	-	1776
Total - Barkley Sound		13 sets		8270	1569	1558	1523	1594	1594	7838	1752	379	388	215	388	382	17860

Table 6. Herring tag releases in the upper Strait of Georgia in the late spring of 1982.

Section	Locality	Map Ref.	Date D/M/Y	Tons in set	Tag Type	Fish Rel.
		UPPER STRAIGHT OF GEORGIA				
Heriot Bay	Yaculta Village	(F1)	17/06/82	0.5	Short- W	497
Pender Harbour	Francis Point	(F2)	10/06/82	0.5	Fine - I	496
	Francis Point	(F3)	10/06/82	0.5	Fine - I	496
	Francis Point	(F4)	11/06/82	0.5	Fine - I	493
	Francis Point	(F5)	11/06/82	0.5	Fine - I	497
Total			5 sets			2479

Table 7. Age distribution of herring in tagging tows made offshore the west coast of Vancouver Island in the fall of 1981.

Map ref.	Location	n	% at age				
			2	3	4	5	6+
(A1)	Swiftsure Bank	81	0	7	32	41	20
(A2)	Swiftsure Bank	65	38	32	17	8	5
(A3)	Swiftsure Bank	75	0	33	35	15	17
(A4)	Swiftsure Bank	81	0	49	28	14	9
(A5)	Nitinat Canyon	82	0	40	27	13	20
(A6)	Nitinat Canyon	79	0	33	46	20	1
(A7)	Prairie	78	0	14	37	15	33
(A8)	South East Corner	73	0	8	51	26	15
(A9)	South East Corner	88	0	22	42	26	10
(A10)	Loudoun Canyon	70	9	57	17	14	3
(A11)	Barkley Canyon	83	0	4	10	41	46
(A12)	Barkley Canyon	73	0	14	36	30	21

Table 8. Age distribution of herring in tagging sets made in the lower Strait of Georgia in the fall of 1981.

Map ref.	Location	n	% at age				
			2	3	4	5	6+
(B1)	Porlier Pass	67	16	36	22	15	10
(B2)	Porlier Pass	62	6	44	34	6	10
(B3)	Ruxton Pass	65	2	37	40	12	9
(B4)	Ruxton Pass	68	1	32	43	22	1
(B5)	Ruxton Pass	68	4	44	35	13	3
(B6)	Ruxton Pass	65	3	58	25	12	2
(B7)	Ruxton Pass	59	3	46	44	5	2
(B8)	Ruxton Pass	59	7	73	24	5	2
(B9)	Ruxton Pass	58	5	60	26	9	0
(B10)	Ruxton Pass	N/S					
(B11)	Danger Reefs	60	0	42	48	3	7
(B12)	Danger Reefs	68	16	53	24	7	0
(B13)	Danger Reefs	70	0	40	29	19	13

Table 9. Age distribution, percent maturity, and average gonosomatic index (G.I.) of herring in seine sets for spring 1982 North Coast taggings.

Map ref.	Location	n	% at age					n	% Mature		Av. G.I.	
			2	3	4	5	6+		MM	FF	MM	FF
(C1)	Steamer Pass	90	0	20	3	73	3	100	100	100	0.17	0.20
(C2)	Somerville Bay	81	0	22	14	59	5	100	100	97	0.17	0.19
(C3)	Somerville Bay	88	1	24	9	61	5	98	100	100	0.21	0.28
(C4)	Wales Passage	83	0	27	5	60	8	100	96	100	0.16	0.22
(C5)	Wales Passage	90	0	14	8	71	7	99	100	100	0.20	0.26
(C6)	Union Inlet	86	0	30	2	60	7	100	100	100	0.18	0.21
(C7)	Birnie Island	84	1	26	8	62	2	99	100	100	0.17	0.20
(C8)	Maskelyne Island	91	0	36	10	53	1	99	100	100	0.20	0.26
(D1)	Butler Cove	N/S										
(D2)	Butler Cove	N/S										
(D3)	Robert Island	89	1	15	4	71	9	100	82	85	0.15	0.20
(D4)	Snass Point	82	1	7	2	87	2	99	87	86	0.18	0.22
(D5)	Absalom Island	91	0	9	10	76	5	99	85	100	0.16	0.26
(D6)	Gurd Island	89	0	7	6	81	7	100	90	97	0.17	0.26
(D7)	Gurd Island	81	0	2	12	79	6	100	80	96	0.16	0.24
(D8)	Ness Islands	96	0	9	3	82	5	100	100	98	0.19	0.25

Table 10. Age distribution, percent maturity, and average gonosomatic index (G.I.) of herring in seine sets for spring 1982 Barkley Sound taggings.

Map ref.	Location	n	% at age					n	% Mature		Av. G.I.	
			2	3	4	5	6+		MM	FF	MM	FF
(E1)	Loudoun Channel	57	12	35	32	9	12	100	95	98	0.18	0.21
(E2)	Pinnacle Rock	73	11	32	19	19	19	100	100	100	0.19	0.22
(E3)	Pinnacle Rock	72	10	17	39	17	18	99	100	100	0.20	0.26
(E4)	Pinnacle Rock	60	23	47	17	7	7	96	97	100	0.22	0.26
(E5)	Pinnacle Rock	46	4	30	37	22	7	98	100	100	0.18	0.25
(E6)	Chrow Islands	57	5	11	25	7	53	99	82	65	0.14	0.14
(E7)	Chrow Islands	N/S										
(E8)	Chrow Islands	48	2	25	42	23	8	100	100	100	0.20	0.27
(E9)	Chrow Islands	68	1	26	29	24	19	98	100	100	0.20	0.27
(E10)	Chrow Islands	65	3	25	35	26	11	100	100	100	0.19	0.29
(E11)	Lyall Point	75	8	27	29	11	25	99	97	90	0.17	0.19
(E12)	Lyall Point	61	7	20	39	28	7	100	100	100	0.19	0.21
(E13)	Mayne Bay	48	2	35	23	27	13	100	100	100	0.18	0.21

Table 11. Age distribution of herring in tagging sets made in the upper Strait of Georgia in the late spring of 1982.

Map ref.	Location	n	% at age					
			1	2	3	4	5	6+
(F1)	Yaculta Village	90	0	93	7	0	0	0
(F2)	Francis Point	89	100	0	0	0	0	0
(F3)	Francis Point	91	100	0	0	0	0	0
(F4)	Francis Point	N/S						
(F5)	Francis Point	N/S						

Table 12. Summary of herring tag releases and recoveries to June 30, 1982 - by period and region of release and by season and fishery (for 1981-82) of recovery.

Season and region of release	1979-80 Season	1980-81 Season	1981-82 season						Sets and tows			Tags		
			Summer & Fall	Food	Other Winter	(a) Roe	Spring	Unknown	Rel.	Rec.	% Rec.	Rel.	Rec.	% Rec.
1979 FALL														
Johnstone Strait	1	-	-	-	-	-	-	-	1	1	100	541	1	0.18
S. of Georgia - W.	30	3	-	-	-	-	-	-	9	5	56	4,438	33	0.74
COAST - total	31	3	-	-	-	-	-	-	10	6	60	4,979	34	0.68
1980 SPRING														
Queen Charlotte Is.	2	6	-	1	-	3	-	-	8	6	75	4,861	12	0.25
North Coast	3	4	-	-	-	-	-	-	10	5	50	7,278	7	0.11
Central Coast	2	1	-	-	-	1	-	-	13	3	23	10,005	4	0.04
Johnstone Strait	8	1	-	-	-	-	-	-	2	1	50	1,037	9	0.87
S. of Georgia - E.	7	-	-	-	-	-	-	-	2	2	100	1,676	7	0.42
S. of Georgia - W.	3	1	-	1	-	4	-	-	10	6	60	6,666	9	0.14
W.C.V.I. - nearshore	-	10	-	-	-	5	-	-	13	7	54	10,687	15	0.14
COAST - total	25	23	-	2	-	13	-	-	61	30	49	46,951	63	0.14
1980 FALL														
North Coast		3	-	1	-	-	-	1	3	1	33	2,982	5	0.17
Johnstone Strait		7	-	-	-	-	-	-	8	4	50	3,888	7	0.18
S. of Georgia - W.		33	-	5	-	6	-	5	16	14	88	8,600	49	0.57
W.C.V.I. - offshore		12	-	3	-	4	-	-	16	10	63	14,349	19	0.13
COAST - total		55	-	9	-	10	-	6	43	29	67	29,819	80	0.27

Table 12 (con'd)

Season and region of release	1979-80 Season	1980-81 Season	1981-82 season						Sets and tows			Tags		
			Summer & Fall	Food	Other Winter	(a) Roe	Spring	Un-known	Rel.	Rec.	% Rec.	Rel.	Rec.	% Rec.
1981 SPRING														
Queen Charlotte Is.		8	1	-	-	14	-	-	24	11	46	14,344	23	0.16
North Coast		12	-	10	-	2	-	1	18	10	56	12,904	25	0.19
Central Coast		1	1	3	-	10	-	-	33	10	30	18,298	15	0.08
Johnstone Strait		60	1	-	-	-	-	1	12	9	75	6.396	62	0.97
S. of Georgia - E.		1	1	1	-	2	-	-	3	2	67	1,987	5	0.25
S. of Georgia - W.		3	-	5	-	6	-	-	32	12	38	17,772	14	0.08
W.C.V.I. - nearshore		22	-	1	2	5	-	-	19	12	63	9,393	30	0.33
COAST - total		107	4	20	2	39	-	2	141	66	47	81,094	174	0.22
1981 FALL														
S. of Georgia - W.				306	28	161	2	4	14	14	100	19,656	501	2.55
W.C.V.I. - offshore			2	1	1	24	-	-	12	10	83	10,391	28	0.27
COAST - total			2	307	29	185	2	4	26	24	92	30,047	529	1.76
1982 SPRING														
North Coast						67(59)	-	-	16	14	88	17,443	67	0.38
S. of Georgia - E.							1	-	5	1	20	2,479	1	0.04
W.C.V.I. - nearshore						235(226)	-	-	13	13	100	17,860	235	1.34
COAST - total						302(285)	1	-	34	28	69	37,731	303	0.59
ALL	56	188	6	338	31	549(532)	3	12	315	183	58	229,432	1,183	0.52

(a)Because of double tagging, maximum and minimum (in parenthesis) recoveries are given

Table 13. Tag recoveries from Queen Charlotte Islands taggings and fisheries.

Section and fishery of recovery	Section and season of release								
	Rennell	Louscoone	Cumshewa		Laskeek	Skincuttle		Area 5-S	Area 24
	80Sp	80Sp	80Sp	81Sp	81Sp	80Sp	81Sp	80Fa	80Sp
Cumshewa									
1981 - Summer & Fall	-	-	-	1	-	-	-	-	-
Laskeek									
1981 - Roe	-	-	-	-	6	-	-	2	-
1981 - Spring	-	-	2	-	-	-	-	-	-
1982 - Roe	-	-	-	-	-	-	1	-	1
Skincuttle									
1980 - Roe	-	-	-	-	-	2	-	-	-
1981 - Roe	-	-	-	-	-	1	-	-	-
1982 - Roe	-	1	-	1	3	1	6	-	-
North Coast									
1980 - Food	1	-	-	-	-	-	-	-	-
1981 - Spring	-	-	-	1	-	-	-	-	-
1981 - Food	-	-	1	-	-	-	-	-	-
Unknown									
1981 - Roe	-	-	1	-	1	1	-	-	-
1982 - Roe	1	-	-	-	2	-	1	-	-

Table 14. Tag recoveries from North Coast taggings and fisheries.

Section and fishery of recovery	Section and season of release																	
	Rennell	Cumshewa		Portland	Port Sim.-Big Bay			Edye-Malacca		Kitkatla			Area 5 - S					
	80Sp	80Sp	81Sp	82Sp	80Sp	81Sp	82Sp	80Sp	81Sp	80Sp	81Sp	82Sp	80Fa	81Sp				
Laskeek 1981 - Roe	-	-	-	-	-	-	-	-	-	-	-	-	2	-				
Alaska 1982 - Roe	-	-	-	2	-	-	-	-	-	-	-	-	-	-				
Portland 1980 - Summer/Fall	-	-	-	-	1	-	-	-	-	-	-	-	-	-				
Port Simp.-Big Bay 1980 - Spring	-	-	-	-	1	-	-	-	-	-	-	-	-	-				
1981 - Spring	-	-	-	-	-	1	-	-	-	-	-	-	-	-				
1982 - Roe	-	-	-	18	-	1	13	-	-	-	-	-	-	-				
Other Area 4 1980 - Summer/Fall	-	-	-	-	-	-	-	-	-	1	-	-	-	-				
Edye - Malacca 1981 - Roe	-	-	-	-	-	-	-	-	7	-	-	-	-	-				

Table 14 (con'd)

Section and fishery of recovery	Section and season of release																	
	Rennell	Cumshewa		Portland	Port Sim.-Big Bay			Edye-Malacca		Kitkatla			Area 5 - S	
	80Sp	80Sp	81Sp	82Sp	80Sp	81Sp	82Sp	80Sp	81Sp	80Sp	81Sp	82Sp	80Fa	81Sp
Kitkatla														
1981 - Roe	-	-	-	-	1	-	-	-	1	-	3	-	1	-
1981 - Spring	-	-	1	-	-	-	-	-	-	-	-	-	-	-
1982 - Roe	-	-	-	-	-	-	-	-	-	-	1	33	-	-
Area 5 - South														
1980 - Spring	-	-	-	-	1	-	-	-	-	-	-	-	-	-
1980 - Food	1	-	-	-	-	-	-	2	-	-	-	-	-	-
1981 - Food	-	1	-	-	-	7	-	-	3	-	-	-	1	-
Unknown														
Unknown	-	-	-	-	-	-	-	-	-	-	-	-	1	1
1982 - Roe	-	-	-	-	-	-	-	-	-	-	-	1	-	-

Table 15. Tag recoveries from Central Coast taggings and fisheries.

Area and fishery of recovery	Area and season of release						
	Area 6	Area 7		Area 8	Area 9	Area 17 - S	
	81Sp	80Sp	81Sp	80Sp	81Sp	80Sp	81Fa (post)
Area 6							
1981 - Roe	1	-	-	-	-	-	-
1981 - Summer/Fall	1	-	-	-	-	-	-
1981 - Food	2	-	-	-	-	-	-
Area 7							
1980 - Spring	-	2	-	-	-	-	-
1981 - Roe	-	1	-	-	-	-	-
1982 - Roe	1	-	4	1	-	1	1
Area 10							
1982 - Roe	-	-	-	-	1	-	-
Area 12							
1981 - Summer/Fall	-	-	1	-	-	-	-
Area 23							
1982 - Roe	-	-	1	-	-	-	-
Unknown							
1982 - Roe	-	-	3	-	-	-	-

Table 16. Tag recoveries from Johnstone Strait taggings and fisheries.

Area and fishery of recovery	Area and season of release										
	Area 7	Area 12		Area 13					Area 15		Area 17S
	80Sp	80Sp	81Sp	79Fa	80Sp	80Fa	81Sp	82Sp (late)	80Sp	81Sp	80Fa (pre)
Area 12											
1980 - Spring	-	2	-	-	-	-	-	-	1	-	-
1981 - Spring	-	-	2	-	-	-	-	-	-	-	-
1981 - Summer/Fall	1	-	-	-	-	-	-	-	-	-	-
Area 13											
1980 - Roe	-	-	-	1	6	-	-	-	-	-	-
1980 - Summer/Fall	-	-	-	-	1	-	-	-	-	-	-
1981 - Roe	-	-	-	-	-	6	56	-	-	-	-
1981 - Spring	-	-	-	-	-	-	1	-	-	1	-
1981 - Summer/Fall	-	-	-	-	-	-	-	-	-	1	-
1982 - Spring	-	-	-	-	-	-	-	1	-	-	-
Unknown	-	-	-	-	-	-	-	-	-	-	1
Area 15											
1981 - Roe	-	-	-	-	-	1	1	-	-	-	-
Area 17 - S											
1981 - Summer/Fall	-	-	-	-	-	-	1	-	-	-	-
Unknown											
Unknown	-	-	1	-	-	-	-	-	-	-	-

Table 17. Tag recoveries from Strait of Georgia - mainland coast taggings and fisheries.

Area and fishery of recovery	Area and season of release			
	Area 13		Area 15	
	80Fa	81Sp	80Sp	81Sp
Area 12				
1980 - Spring	-	-	1	-
Area 13				
1981 - Spring	-	-	-	1
1981 - Summer/Fall			-	1
Area 15				
1980 - Roe	-	-	1	-
1980 - Spring	-	-	5	-
1981 - Roe	1	1	-	-
Area 14				
1982 - Roe	-	-	-	1
Area 17 - S				
1981 - Food	-	-	-	1
1982 - Roe	-	-	-	1

Table 18. Tag recoveries from Strait of Georgia - Vancouver Island coast taggings and fisheries.

Area and fishery of recovery	Area and season of release																								
	A 13		A15	A 14		A 17-N		A 17-S								A 18				WCVI offish		A 24	USA
	81Sp	82Sp	81Sp	80Sp	81Sp	80Sp	81Sp	79Fa (pre)	79Fa (post)	80Sp	80Fa (pre)	80Fa (post)	81Sp	81Fa (pre)	81Fa (post)	80Sp	80Fa	80Fa (pre)	81Sp (post)	80Fa	81Fa	81Sp	81Sp
Area 7																							
1982 - Roe	-	-	-	-	-	-	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-
Area 13																							
1982-Sum/Fa	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Unknown	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
Area 14																							
1980-Spring	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981-Roe	-	-	-	-	-	-	-	3	-	1	1	4	-	-	-	-	2	-	-	1	2	-	-
1982-Roe	-	-	-	-	4	1	-	-	-	2	-	-	-	27	17	-	-	-	-	-	1	-	-
Area 17 - N																							
1981 - Roe	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Area 17 - S																							
1979 - Food	-	-	-	-	-	-	-	23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1979/80-Win	-	-	-	-	-	-	-	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1980-Spring	-	-	-	1	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1980 - Food	-	-	-	-	-	-	-	-	-	-	13	-	-	-	-	-	-	-	-	4	-	-	-
1980/81-Win	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	3	1	-	-	-	-

Table 18 (cont'd)

Area and fishery of recovery	Area and season of release																							
	A 13		A15	A 14		A 17-N		A 17-S								A 18				WCVI offsh		A 24	USA
	81Sp	82Sp	81Sp	80Sp	81Sp	80Sp	81Sp	79Fa (pre)	79Fa (post)	80Sp	80Fa (pre)	80Fa (post)	81Sp	81Fa (pre)	81Fa (post)	80Sp	80Fa (pre)	80Fa (post)	81Sp	80Fa	81Fa	81Sp	81Sp
Area 17S (cont'd)																							
1981 - Roe	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
1981-Sum/Fa	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981 - Food	-	-	1	-	1	-	1	-	-	-	2	2	1	306	-	-	-	-	2	3	1	1	1
1981/82-Win	-	-	-	-	-	-	-	-	-	-	-	-	-	15	13	-	-	-	-	-	1	-	1
1982 - Roe	-	-	1	-	1	-	-	-	-	-	1	-	-	43	62	-	3	-	-	1	7	-	-
Area 18																							
1979 - Food	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1980/81-Win	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
Area 19																							
1981-Sum/Fa	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	1	-	-
1981/82 -Winter	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-
Area 23																							
1982 - Roe	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1	-	-	-	-	-	-	-	-
Area 27																							
1981 - Roe	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
WCVI - offshore																							
1981-Spring	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 18 (cont'd)

Area and fishery of recovery	Area and season of release																						
	A 13		A15	A 14		A 17-N		A 17-S								A 18				WCVI offsh		A 24	USA
	81Sp	82Sp	81Sp	80Sp	81Sp	80Sp	81Sp	79Fa (pre)	79Fa (post)	80Sp	80Fa (pre)	80Fa (post)	81Sp	81Fa (pre)	81Fa (post)	80Sp	80Fa (pre)	80Fa (post)	81Sp	80Fa	81Fa	81Sp	81Sp
U.S.A.																							
1980 - Roe	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-
1982-Spring	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-
Unknown																							
Unknown	-	-	-	-	-	-	-	-	-	-	3	-	-	4	-	-	-	1	-	-	-	-	-
1980/81-Win	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
1981 - Roe	-	-	-	-	-	-	-	-	-	-	1	3	-	-	-	-	1	-	-	-	-	-	-
1982 - Roe	-	-	-	-	1	-	-	-	-	-	-	-	-	8	-	-	1	-	-	-	-	-	-

Table 19. Tag recoveries from west coast of Vancouver Island - nearshore taggings and fisheries.

Area and fishery of recovery	Area and season of release											
	Area 7	Area 17-S	Area 18	WCVI Offsh.		Area 23			Area 24		Area 25	Area 26
	81Sp	81Fa	80Fa	80Fa	81Fa	80Sp	81Sp	82Sp	80Sp	81Sp	80Sp	80Sp
Laskeek												
1982 - Roe	-	-	-	-	-	-	-	-	1	-	-	-
Area 17 - S												
1980 - Food	-	-	-	-	-	1	-	-	-	-	-	-
1981 - Food	-	-	-	-	-	-	-	-	-	1	-	-
Area 19												
1981/82 - Winter	-	-	-	-	-	-	-	-	-	2	-	-
Area 23												
1981 - Roe	-	-	-	1	-	1	6	-	1	-	-	-
1982 - Roe	1	3	-	3	9	1	3	165	-	-	-	-
Area 24												
1981 - Roe	-	-	-	1	-	-	-	-	1	10	-	-
1982 - Roe	-	-	-	-	1	-	-	24	-	-	-	-
Area 25												
1981 - Roe	-	-	-	3	-	-	2	-	1	-	-	-
1982 - Roe	-	-	-	-	2	2	-	5	-	-	-	-

Table 19 (con'd)

Area and fishery of recovery	Area and season of release											
	Area 7	Area 17-S	Area 18	WCVI Offsh.		Area 23			Area 24		Area 25	Area 26
	81Sp	81Fa	80Fa	80Fa	81Fa	80Sp	81Sp	82Sp	80Sp	81Sp	80Sp	80Sp
Area 26												
1980 - Summer/Fall	-	-	-	-	-	-	-	-	-	-	-	1
Area 27												
1981 - Roe	-	-	1	-	-	-	-	-	-	-	-	-
U.S.A.												
1980 - Summer/Fall	-	-	-	-	-	1	-	-	-	-	-	-
1981 - Spring	-	-	-	-	-	-	-	-	1	-	-	-
Unknown												
1981 - Roe	-	-	-	-	-	-	5	-	1	-	1	-
1982 - Roe	-	-	-	-	-	-	-	41	1	-	-	-

Table 20. Tag recoveries from west coast of Vancouver Island - offshore taggings and fisheries.

Area and fishery of recovery	Area and season of release				
	Area 14	Area 21		Area 23	
	81Sp	80Fa	81Fa	80Fa	81Fa
Area 14					
1981 - Roe	-	-	-	1	-
1982 - Roe	-	-	-	-	2
Area 17 - S					
1980 - Food	-	3	-	1	-
1981 - Food	-	1	1	2	-
1981/82-Winter	-	-	1	-	-
1982 - Roe	-	-	3	1	4
Area 19					
1981 Summer/Fall	-	-	1	-	-
W.C.V.I. - Offshore					
1980 - Summer/Fall	-	-	-	1	-
1981 - Spring	1	-	-	-	-
1981 - Summer/Fall	-	-	1	-	-
Area 23					
1981 - Roe	-	-	-	1	-
1982 - Roe	-	3	4	-	5

Table 20 (con'd)

Area and fishery of recovery	Area and season of release				
	Area 14	Area 21		Area 23	
	81Sp	80Fa	81Fa	80Fa	81Fa
Area 24					
1981 - Roe	-	1	-	-	-
1982 - Roe	-	-	1	-	-
Area 25					
1981 - Roe	-	1	-	2	-
1982 - Roe	-	-	2	-	-
Unknown					
1981 - Roe	-	1	-	-	-
1982 - Roe	-	-	2	-	1

Table 21. Tag recoveries from U.S.A. taggings and fisheries.

Area and fishing of recovery	Area and season of release						
	Portland	Area 17-S		Area 18	Area 23	Area 24	U.S.A.
	82Sp	79Fa (post)	81Fa (pre)	80Sp	80Sp	80Sp	81Sp
Alaska							
1982 - Roe	2	-	-	-	-	-	-
Area 17 - S							
1981 - Food	-	-	-	-	-	-	1
1981/82 - Winter	-	-	-	-	-	-	1
U.S.A mainland							
1980 - Roe	-	1	-	1	-	-	-
1980 - Summer/Fall	-	-	-	-	1	-	-
1981 - Spring	-	-	-	-	-	1	-
1982 - Spring	-	-	2	-	-	-	-

Table 22. Summary of 1981 fall pre-food fishery taggings and of recoveries from these in the 1981 food fisheries in the lower Strait of Georgia.

Tagging	M (rel)	M (N17)(a)	R (N17)(b)	M (N24)(c)	R (N24)(d)	M (N30)(c)	R (N30)(e)
Nov. 9 - a - 1	999	899.10	25.42	873.86	31.35	842.51	27.36
Nov. 9 - b - 2	499	449.10	36.14	412.96	0.00	412.96	18.58
Nov. 10 - a - 3	998	898.20	13.47	884.43	30.56	853.87	64.67
Nov. 10 - b - 4	987	888.30	9.26	879.24	50.38	828.86	66.64
Nov. 12 - 5	998	898.20	29.07	869.13	39.40	829.73	51.04
Nov. 16 - 6	996	896.40	4.35	892.05	51.22	840.83	40.99
Nov. 23 - 7	1998	-	-	-	-	1798.20	9.95
Nov. 24 - 8	1696	-	-	-	-	1526.40	243.78
Nov. 9 - 12	4481	4032.90	113.46	3916.62	151.69	3757.93	228.29
Nov. 9 - 16	5477	4929.30	117.81	4811.67	202.91	4598.76	269.28
Nov. 9 - 24	9171	-	-	-	-	7923.36	513.06

(a)Tagging survival adjustment of 0.9.
(b)Plant recovery rate adjustment of 0.236.
(c)Adjusted for recaptures in previous fisheries.
(d)Plant recovery rate adjustment of 0.319.
(e)Plant recovery rate adjustment of 0.402.

Table 23. Adjusted Peterson mark-recapture estimates for 1981 lower Strait of Georgia population.

Taggings	Fishery	M	R	C(b)	N(a,e)	SD(b,f)	Sample error (95% confidence for R)			
							R1(c)	R2(d)	N1(b,c)	N2(b,c)
Nov. 9-12	Nov. 17	4,032.90	113.46	2,100	73,992	6,916	136.35	94.41	61,661	88,765
	Nov. 24	3,916.62	151.69	2,424	64,294	5,033	178.10	129.26	55,109	74,761
	Nov. 30	3,757.93	228.93	1,550	29,864	1,671	260.30	201.00	26,822	33,367
	All	4,032.90	494.08	6,074	49,491	2,224	539.61	452.39	45,323	54,042
Nov. 9-16	Nov. 17	4,929.30	117.81	2,100	87,144	7,995	141.09	98.37	72,867	104,192
	Nov. 24	4,811.67	202.91	2,424	59,311	4,006	232.82	176.84	51,993	67,698
	Nov. 30	4,598.76	269.28	1,550	30,903	1,605	303.42	238.98	27,994	34,233
	All	4,929.30	590.00	6,074	50,671	2,084	639.57	544.27	46,750	54,921
Nov. 9-24	Nov. 30	7,923.36	513.06	1,550	28,418	1,054	559.42	470.54	26,441	30,572

(a)Includes catch from previous fishery (-ies).
(b)In tons - calculations done in pieces and based on Av. fish wt. of 119.0 grams.
(c)R1 $= R + 1.92 + 1.96\sqrt{R + 1.0}$
(d)R2 $= R + 1.92 - 1.96\sqrt{R + 1.0}$
(e)N $= \frac{(M+1)\ (C+1)}{R + 1}$
(f)S.D. $= \sqrt{V(N)}$; $V(N) = \frac{N*N\ (C-R)}{(C+1)\ (R+1)}$

Table 24. Tag recoveries form Barkley Sound pre-roe season taggings (because of double tagging, maximun and minimum—in parenthesis—recoveries are given).

Area and fishery of recovery	Feb 20 (E11)	Feb 20 (E12)	Feb 22 (E13)	Feb 23 (E6)	Feb 27 (E1)	Mar 3 (E7)	Mar 3 (E8)	Mar 4 (E2)	Mar 4 (E3)	Mar 5 (E9)	Mar 6 (E10)	Mar 6 (E4)	Mar 7 (E5)	ALL
Area 23														
Mar 11-12 (permit)	-	1	-	-	-	-	-	-	-	-	-	-	-	1
Mar 14-15 (permit)	1	6	13(12)	1	1	3(2)	2(1)	2	3	3	4	12	9(7)	60(55)
Mar 17-18 (roe-sn)	2	5	14(13)	-	3(2)	1	5(4)	8(7)	5	8	12	27(26)	18(16)	108(101)
Area 24														
Mar 8-9 (roe-sn/gn)	-	2	5(4)	-	-	-	4	1	3(2)	2	1	3	-	21(19)
Mar 14-15 (permit)	-	-	-	1	-	1	1	-	-	-	-	-	-	3
Area 25														
Mar 7-11 (roe-gn)	-	-	1	-	-	-	-	1	1	2(1)	-	-	-	5(4)
Unknown	1	2	5	4	-	-	6	3	2	2	6	7	3	41
Total	4	16	38(35)	6	4(3)	5(4)	18(16)	15(14)	14(13)	17(16)	23	49(48)	30(26)	239(224)

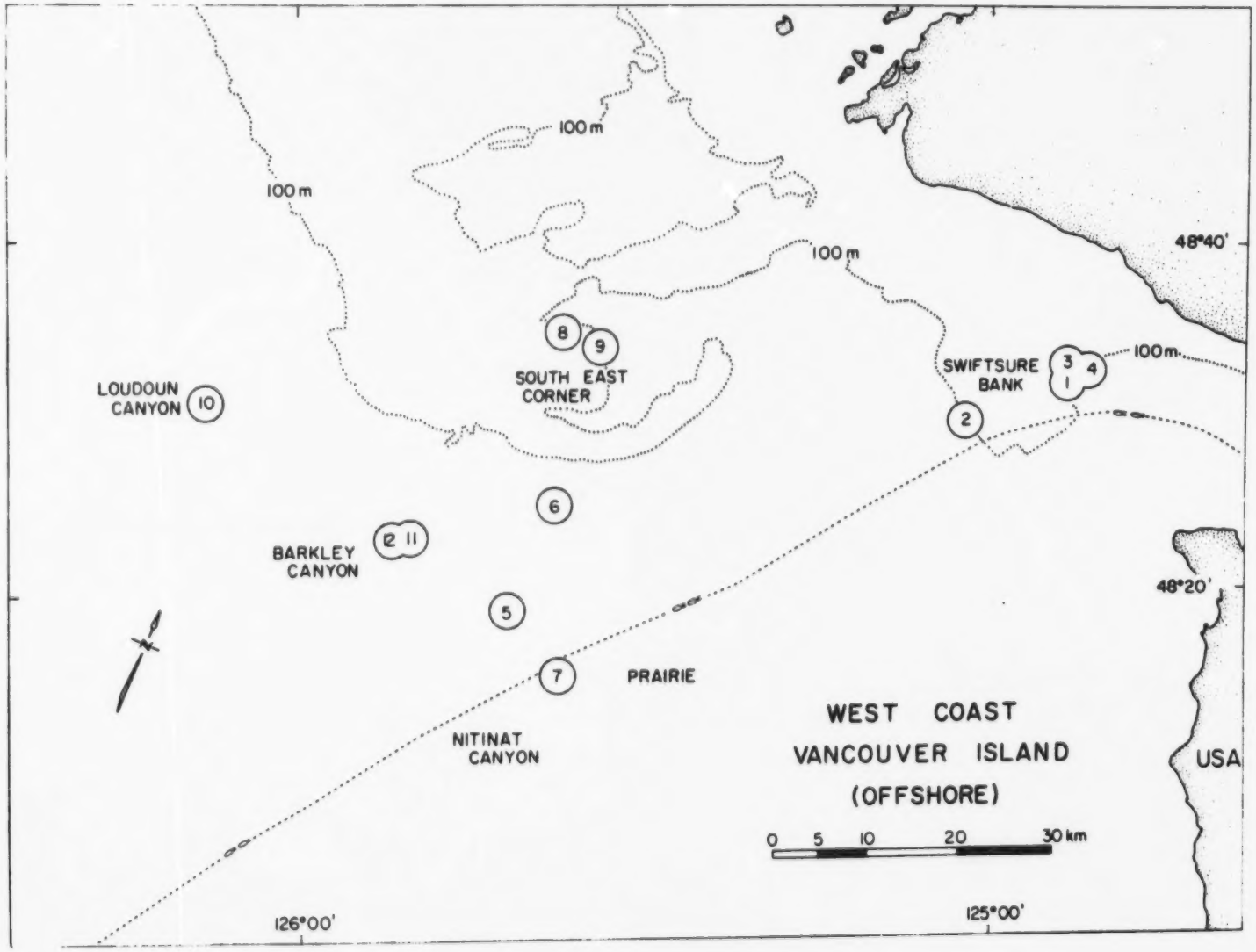

Fig. 1. Map of the west coast of Vancouver Island (A) showing fall 1981 tagging locations.

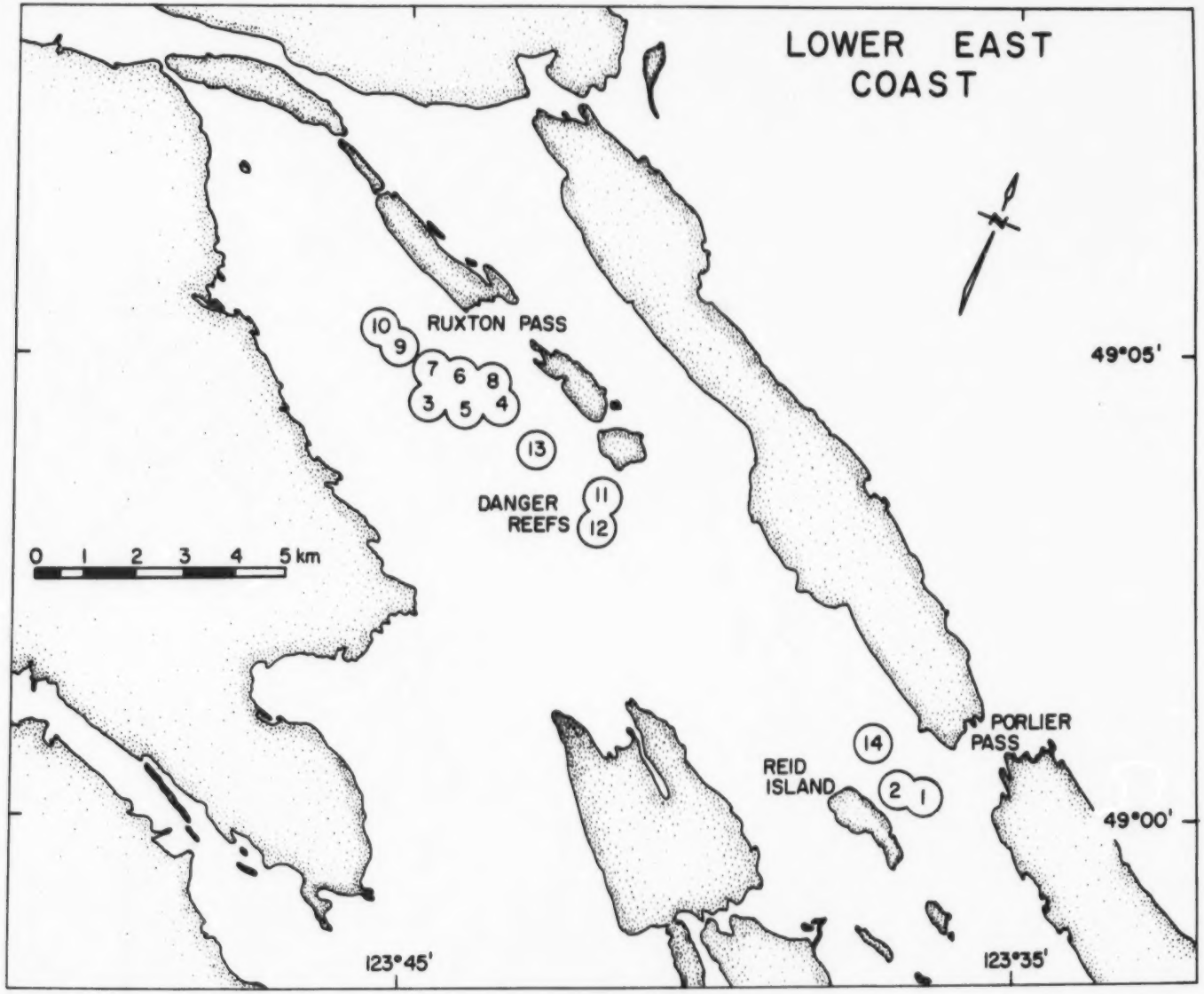

Fig. 2. Map of the lower east coast of the Strait of Georgia (B) showing fall 1981 tagging locations.

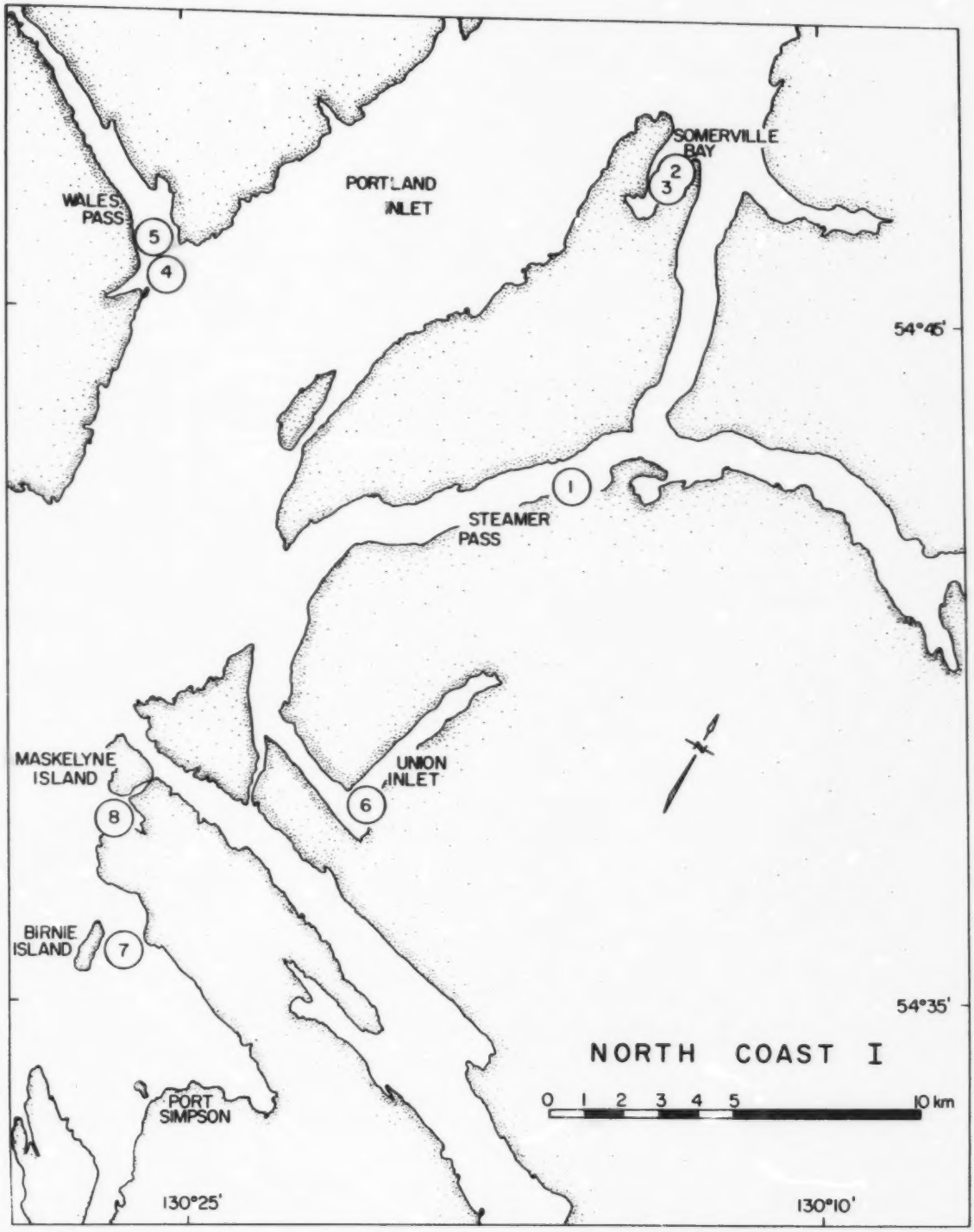

Fig. 3. Map of the North Coast (C) showing spring 1982 tagging locations.

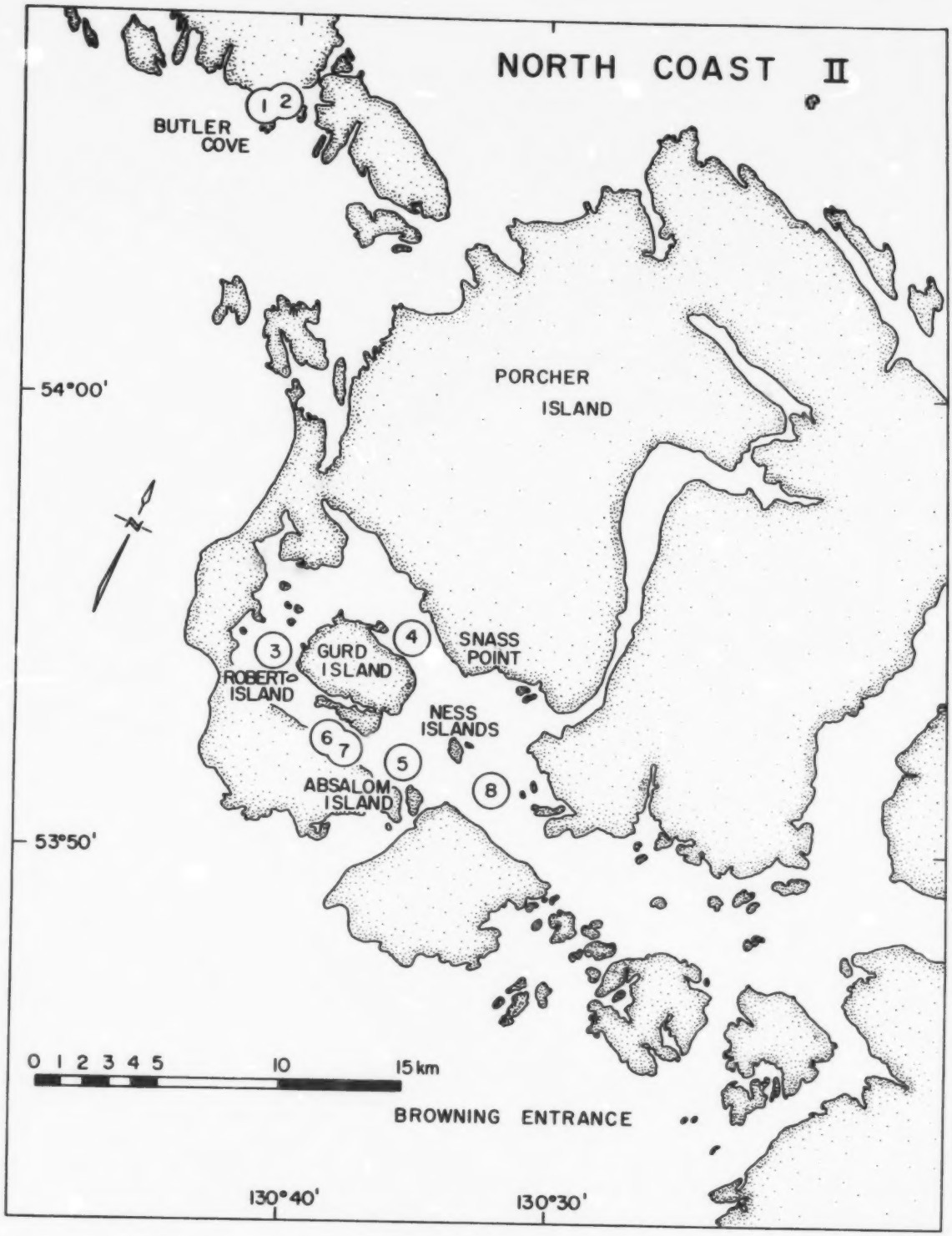

Fig. 4. Map of Porcher Island (D) showing spring 1982 tagging locations.

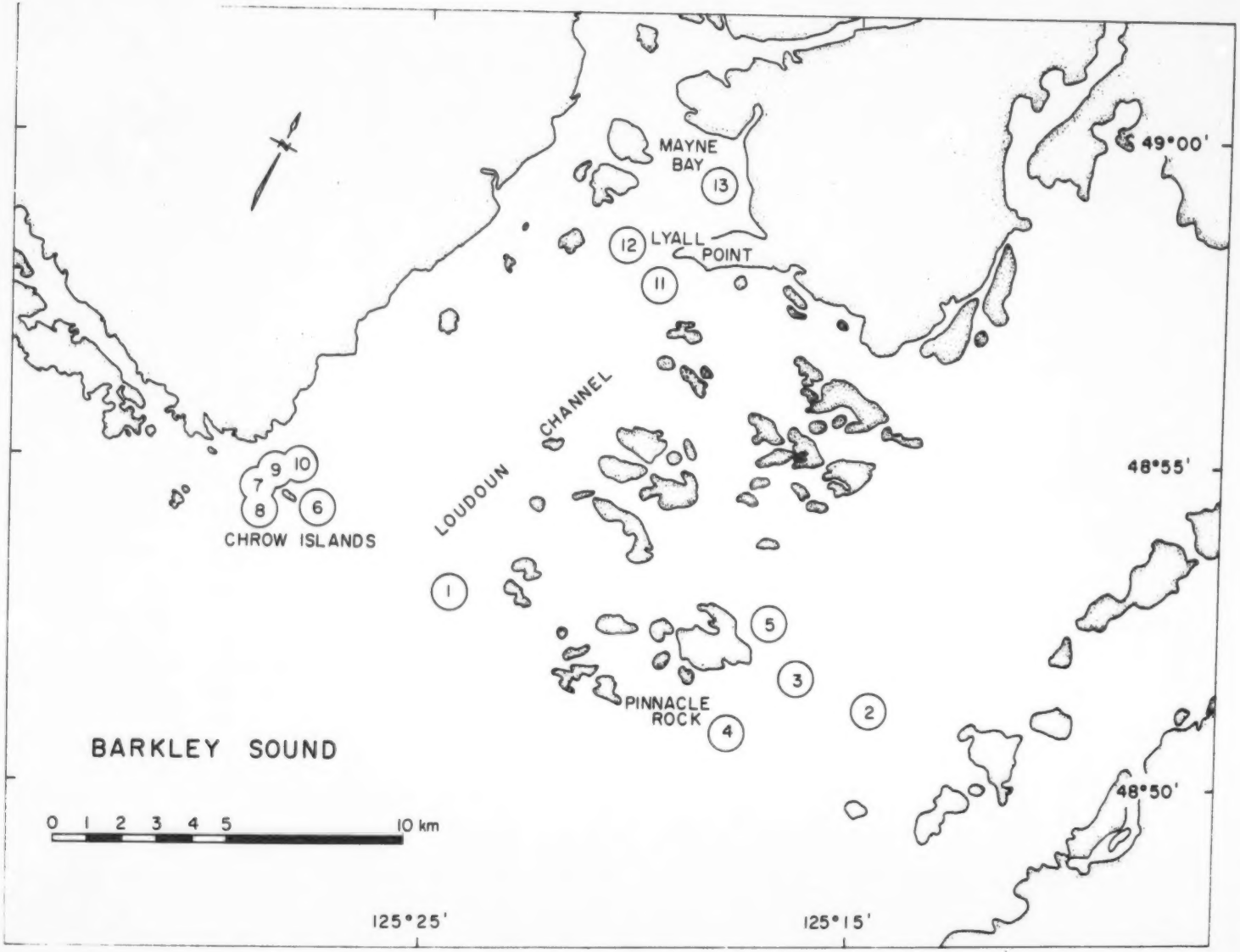

Fig. 5. Map of Barkley Sound (E) showing spring 1982 tagging locations.

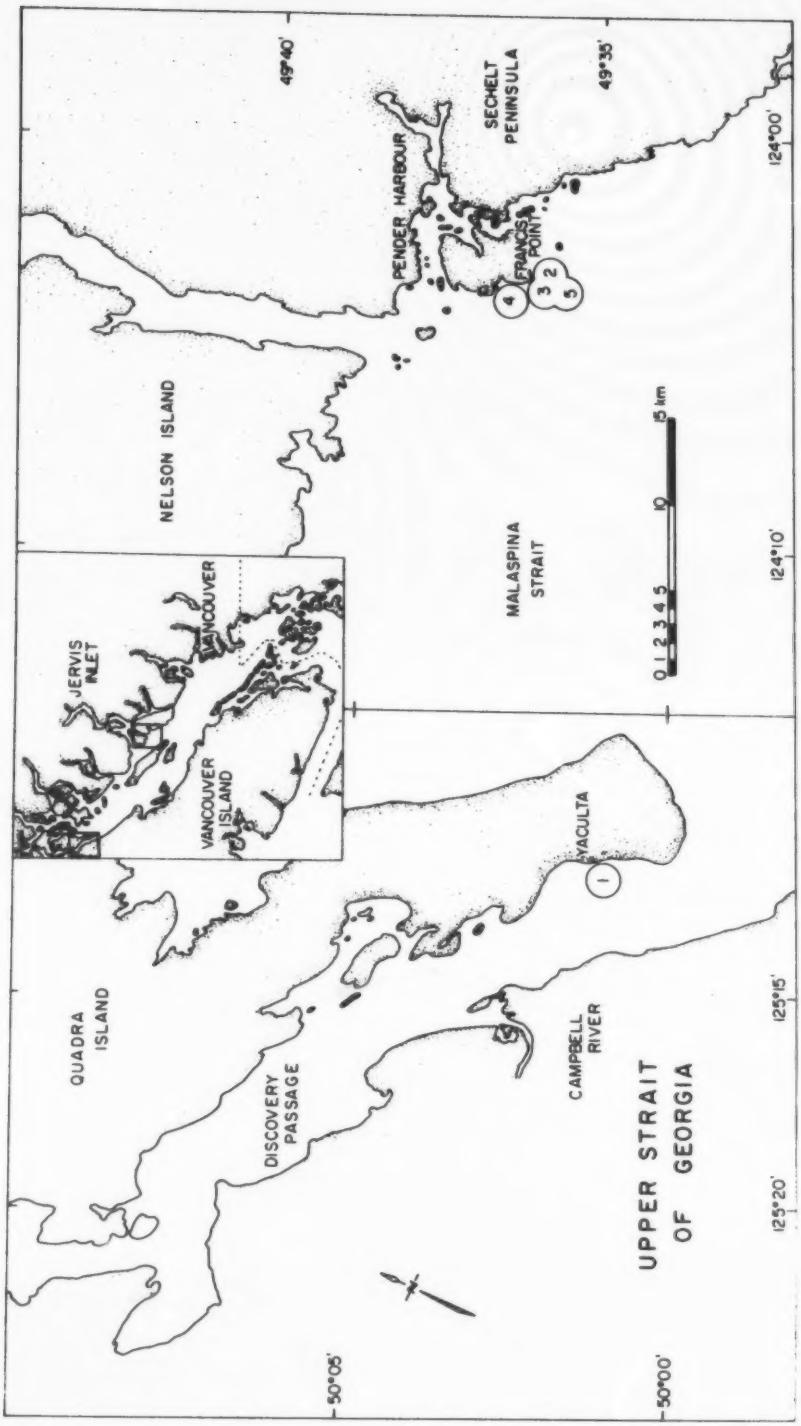

Fig. 6. Map of the upper Strait of Georgia (F) showing late spring 1982 tagging locations.

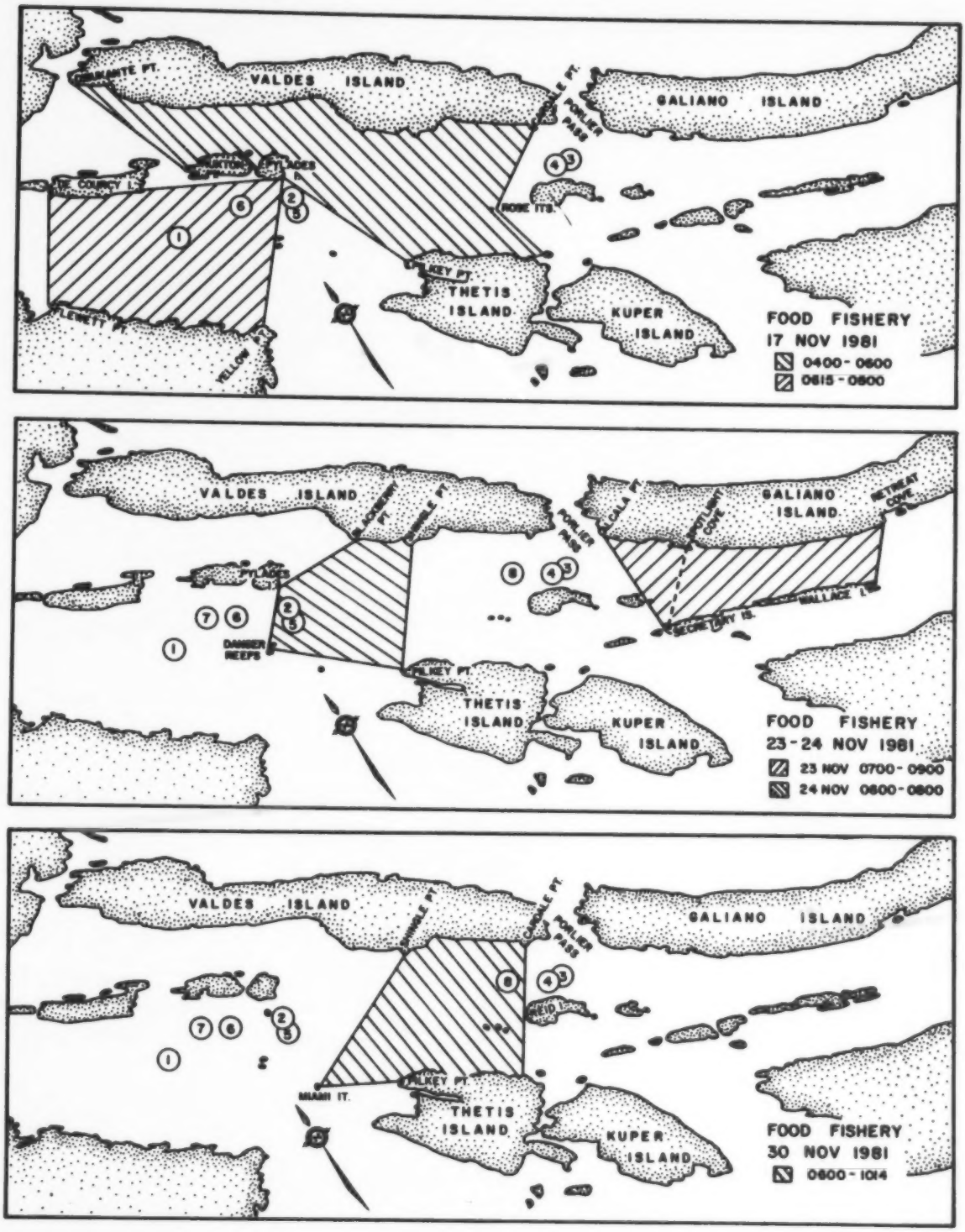

Fig. 7. Food fisheries in the lower Strait of Georgia in 1981. Areas opened to fishing are cross-hatched and the locations of tagging sets, with numbers corresponding to those in Table 22, are shown by circles.

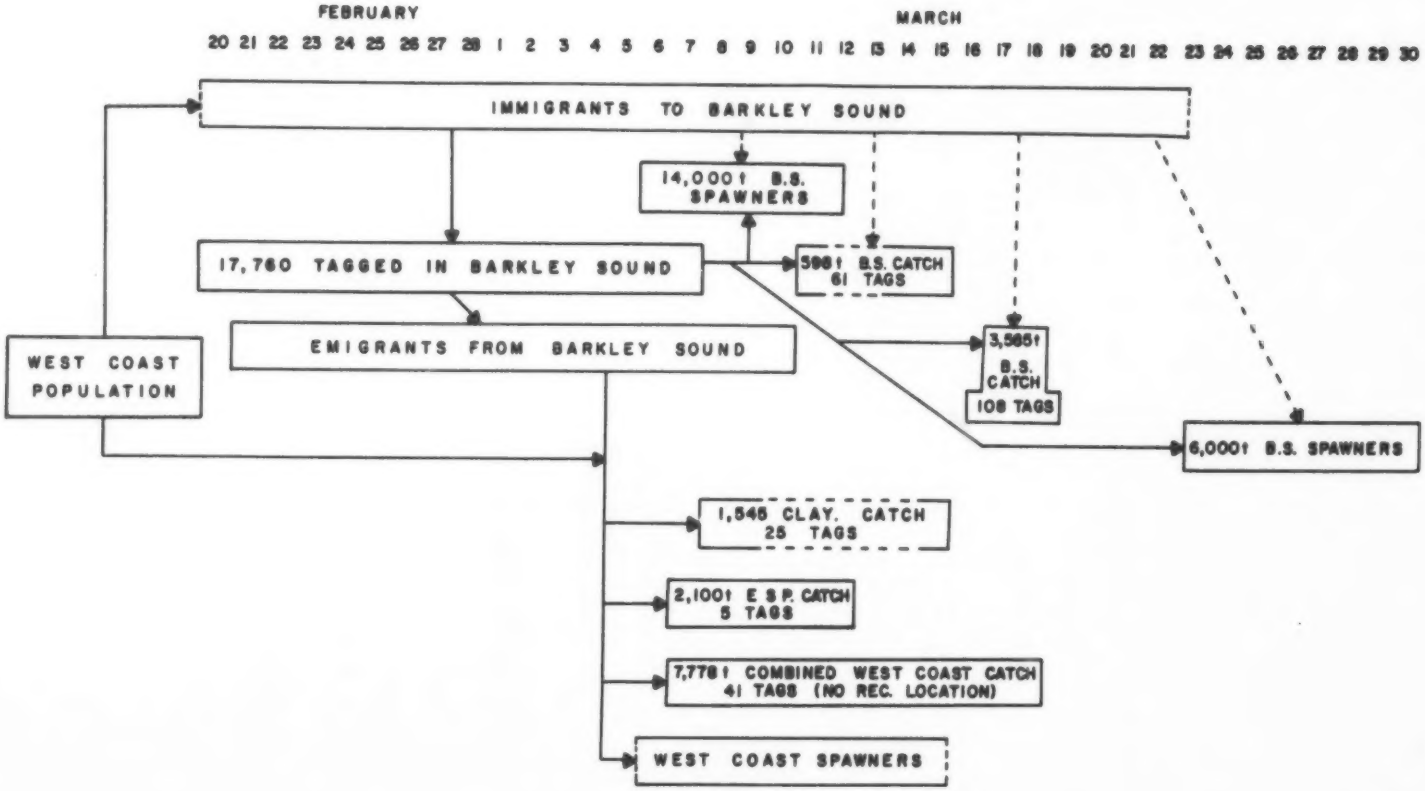
FEBRUARY
MARCH
20 21 22 23 24 25 26 27 28 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
IMMIGRANTS TO BARKLEY SOUND
14,000± B.S. SPAWNERS
17,760 TAGGED IN BARKLEY SOUND
598± B.S. CATCH 61 TAGS
EMIGRANTS FROM BARKLEY SOUND
3,565± B.S. CATCH 108 TAGS
WEST COAST POPULATION
6,000± B.S. SPAWNERS
1,545 CLAY. CATCH 25 TAGS
2,100± E.S.P. CATCH 5 TAGS
7,778± COMBINED WEST COAST CATCH 41 TAGS (NO REC. LOCATION)
WEST COAST SPAWNERS

Fig. 8. Herring stock movements on the west coast of Vancouver Island showing: 1982 tag releases in Barkley Sound; timing and location of spawns; places, times, and catch of 1982 roe fisheries and returns of tags placed in Barkley Sound in 1982.